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Predicting the number of potential military recruits over the next ten years with application to recruiter placement

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THESIS

PREDICTING THE NUMBER OF POTENTIAL MILITARY RECRUITS OVER THE NEXT TEN YEARS WITH APPLICATION TO RECRUITER PLACEMENT

by

Donald L. Britton

September 2007

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Second Reader:	David L. Schiffman

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The object of this thesis was to evaluate Navy recruiter placements, as resource allocation directly affects organizational efficiency and mission success. In order to produce a model to assist decision makers, this study analyzed (1) demographic characteristics of past military applicants; (2) recruiter assignment histories; (3) station ZIP codes; and (4) predicted populations within each ZIP code. ZIP code-level analysis was performed on more than 4 million records provided by the Defense Manpower Data Center (DMDC). The records consisted of all military applicants (those who applied for military service with the intention of enlisting) and accessions (those who reported to basic training) from October 1998-September 2006. Records contained home of record ZIP code and demographic information including age, race, gender, and education. Woods and Poole population data, provided by Navy Recruiting Command (CNRC), was then merged in order to incorporate the 990 possible combinations of demographic characteristics for each ZIP code of the national population from 2000-2020. Computation of service-specific propensities (that is, expected numbers of military applicants) showed that the Navy has been successful in its attempt to effectively place recruiters in order to exploit the available target market. A series of comparison tables was developed to aid decision makers.

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PREDICTING THE NUMBER OF POTENTIAL MILITARY RECRUITS OVER THE NEXT TEN YEARS WITH APPLICATION TO RECRUITER PLACEMENT

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Submitted in partial fulfillment of the
requirements for the degree of

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The object of this thesis was to evaluate Navy recruiter placements, as resource allocation directly affects organizational efficiency and mission success. In order to produce a model to assist decision makers, this study analyzed (1) demographic characteristics of past military applicants; (2) recruiter assignment histories; (3) station ZIP codes; and (4) predicted populations within each ZIP code. ZIP code-level analysis was performed on more than 4 million records provided by the Defense Manpower Data Center (DMDC). The records consisted of all military applicants (those who applied for military service with the intention of enlisting) and accessions (those who reported to basic training) from October 1998-September 2006. Records contained home of record ZIP code and demographic information including age, race, gender, and education. Woods and Poole population data, provided by Navy Recruiting Command (CNRC), was then merged in order to incorporate the 990 possible combinations of demographic characteristics for each ZIP code of the national population from 2000-2020. Computation of service-specific propensities (that is, expected numbers of military applicants) showed that the Navy has been successful in its attempt to effectively place recruiters in order to exploit the available target market. A series of comparison tables was developed to aid decision makers.

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EXECUTIVE SUMMARY

The object of this thesis was to evaluate Navy recruiter placements, as resource allocation directly affects organizational efficiency and mission success. In order to produce a model to assist decision makers, this thesis analyzed (1) demographic characteristics of past military applicants; (2) recruiter assignment histories; (3) station ZIP codes; and (4) predicted populations within each ZIP code.

ZIP code-level analysis was performed on more than 4 million records provided by the Defense Manpower Data Center (DMDC). The records consisted of all military applicants (those who applied for military service with the intention of enlisting) and accessions (those who reported to basic training) from October 1998-September 2006. Records contained home of record ZIP code and demographic information including age, race, gender, and education. Woods and Poole population data, provided from Navy Recruiting Command (CNRC), was then analyzed and a common “demographic string” was associated with both the DMDC and CNRC datasets.

The total number of applicants in each demographic string was divided by nine to get an average number per year. The resulting values were divided by average populations (from 2000-2006) associated with the respective demographic strings in order to obtain a proportion (“demographic string ratio”) of all applicants for each demographic string as compared to the general population. This process modified the DMDC dataset in an attempt to obtain the best possible representation of the population that applied for enlisted military service without assuming that age, race, gender, and education are independent.

The demographic string ratio was applied to each ZIP code for each year from 2000-2020 to produce “Propensenators.” Propensenators give an estimate of the number of individuals in a ZIP code who might be expected to apply to military service, based on the population characteristics of the ZIP code and the

different propensities to enlist exhibited by different demographic groups. Since these Propensenators were derived for each ZIP code, it was possible to aggregate them at the recruiting station, zone, district, and national level. For the nation, the number of Propensenators is predicted to rise until 2009. However, it is also predicted that beginning in 2010, there will be a steady decline in the number of Propensenators until 2016.

The aggregated ZIP code-level data (almost 30,000 ZIP codes) were analyzed at recruiting station (more than 1,800), zone (209), district (26), region (2), and national levels. Applicants are compared to the Propensenators for the same area to determine if an area is under or over producing as compared to the average for the nation, which is an indicator of that area's population propensity to enlist in the military. Computations of service-specific propensities (that is, expected numbers of military applicants) are similarly computed.

The number of recruiters assigned to every station for every year was then used to establish an average number of recruiters per station. This number could then be aggregated to all levels within CNRC to determine how each level of command compared to others in the same year or different years by using the Propensenators for the same time period and area.

A series of comparison tables was developed to aid decision makers. This method showed that the Navy was successful in its attempt to effectively place recruiters in order to exploit the available target market.

I. INTRODUCTION

Navy Recruiting Command (CNRC) has a mission to obtain applicants for the United States Navy's officer and enlisted forces. This study will focus on the enlisted applicants, sometimes referred to as "New Contracts." The Navy has established a monthly quota to meet the its desired end strength on 30 September of each year. To achieve this goal, CNRC has approximately 3,500 recruiters assigned to two regions, which are further broken down into 26 districts, 209 zones, and more than 1,800 stations across the United States. The leaders of these commands assign new recruiters to stations based on factors like experience, projected transfer dates, and past performance of the area, using other market analysis tools provided by CNRC to produce the best chance of success. Currently, the primary tool is the recruiter allocation factor (RAF), which can be calculated in one of four ways:

- **Default RAF (DRAF)** is the default method, calculated from 50 percent population and 50 percent past production, which is all-service accessions averaged for the last five years. This method is preferred by the field, but draws on all service accessions, which are heavily biased to the Army due to the Army's larger share.
- The **Distance from Station** method is used to budget time resources and is calculated by only using the population data within a 25-mile radius from the recruiting station.
- The **High Quality** method focuses maximum effort on the primary target market, Test Score Category I-IIIA applicants (those who scored 50 or above on the Armed Forces Qualification Test (AFQT), and this RAF is calculated from all-service accession data averaged over the last three years.

- The **User Defined** method is based on user preferences. For example, demographics could be the main focus, thereby concentrating more resources in areas with specific demographic characteristics defined by the user.

In the end, each decision maker uses what he or she believes to be the best RAF method for meeting monthly assigned quota, which currently is the only measure of recruiter placement effectiveness. Although decision makers are provided sound options to aid in this placement process, few deviate from DRAF. The purpose of this thesis is to evaluate the effectiveness of past allocation decisions and produce a model that can quantitatively measure recruiter placement effectiveness.

To carry out this evaluation, several data sources were utilized at a level of detail finer than that used in the past, because of limitations in data availability and computational power requirements. CNRC provided several datasets including a detailed population dataset (see Chapter III), recruiter assignment histories, and station mapping (ZIP codes assigned stations, zones, districts, and regions). The Defense Manpower Data Center (DMDC) provided detailed records of every applicant who was processed at a Military Entrance Processing Station and every accession who reported to basic training, and these records contained “home of record” ZIP code, age, gender, education, and race as well as the applicable service (see Chapter IV). After all the data were merged together, several statistical results were available to be analyzed by year, service, age, race, education, gender, and different areas of the country—even by ZIP code. After reviewing the data to determine relative ratios within every category and trends over time, the “Propensenator” (see Chapter V) was computed from observed characteristics and used to produce a series of tables (see Chapter VI) that will aid decision makers in assessing recruiter placement effectiveness.

II. LITERATURE REVIEW

Paul Hogan et al., authors of a paper for the Directorate for Accession Policy, attempted to capture geographic areas' propensity to enlist in the military for the first time by using ZIP code-level data.[1] It was suggested that this approach is essential to the proper placement of recruiters, since each recruiter is assigned to one station, which is responsible for a geographic area built around ZIP codes. The authors used data obtained using 13 quarters of ZIP code-level data (ending in 1997) from the Army (demographic data for 17-21 year-old population, the area, and the number of high schools) and the Navy (recruiter assignments and new contracts). Additionally, the authors used unemployment rates, per capita income, and household income obtained from the 1990 Census.[2] Results showed that ZIP code-level data can be a powerful tool in predicting enlisted market supply for the Navy and the Army.

Martin, a Naval Postgraduate School thesis student, used ZIP code level data to provide optimization suggestions on recruiting station and personnel placement.[3] The size of some recruiting districts (some of which contained more than 1,000 ZIP codes) and available computing power limited his Master's thesis focus to only a few geographic areas.[4] Results showed that ZIP code-level data can be used to determine optimal station placement and optimal number of recruiters for both Army and Navy.

Hostetler, also a Naval Postgraduate School thesis student, used ZIP code data provided by CNRC to develop an enlistment supply model for the Navy. Like Hogan, et al., Hostetler used 17-21 year olds and 22-29 year olds, but females were excluded from his study. Results showed that ZIP code-level

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[1] Paul F. Hogan et al., "Enlistment Supply at the Local Market Level," Technical Report NPS-SM-00-004, Naval Postgraduate School, Monterey, CA, 15 May 2000, p. i.

[2] Ibid., p. 10·

[3] Paul E. Martin, "A Multi-Service Location-Allocation Model for Military Recruiting," Master's Thesis, Naval Postgraduate School, Monterey, CA, March 1999, p. v.

[4] Ibid., p. 23.

data can be used to produce a valid model for enlistment supply. The analysis also showed that race/ethnicity and population were significant in the model.[5] Unemployment rates were identified as misleading, and the author recommended that population statistics for females be added, as more females were entering the Navy.[6]

In a paper entitled "Population Representation in the Military Services – Fiscal Year 2004," the military was compared to the population with regard to age, race, gender, and education (see the Appendix for related tables and figures). The data were provided by the DMDC and available for applicants (those who processed for entry into the military) and new recruits (those who enlisted and went to basic training).[7] Of interest were file format changes in 1999 and 2000 that made a noticeable difference across years of historical data.[8]

[5] David L. Hostetler, "A Statistical Estimation of Navy Enlistment Supply Models Using Zip Code Level Data," Master's Thesis, Naval Postgraduate School, Monterey, CA, March 1998, p. 33.

[6] Ibid., p. 34.

[7] Department of Defense, "Population Representation in the Military Services – Fiscal Year 2004," Office of the Undersecretary of Defense, Personnel and Readiness, May 2006, retrieved on December 9, 2006, from http://www.dod.mil/prhome/poprep2004/, p. iii.

[8] Ibid., p. 1-5.

III. DATA

A. WOODS AND POOLE

Navy Recruiting Command (CNRC) provided data for each county and ZIP code in the United States from Woods and Poole, an independent company that uses actual and predicted counts of population by historical data from 1970 to the present used to predict future values of several economic and demographic characteristics. Specifically, the data contained age, gender, education level, and race for years 2000-2020. These records were compressed within three "Residence Status" folders for documented, undocumented, and total population. Three datasets were compiled from the three respective folders, and each dataset contained 29 fields and 29,583,180 records. It was determined that of the three datasets, the total population file would be used in this study. This dataset is referred to as "Population Data."

The study's elementary building block was the ZIP code, and the records within each of these were compiled based on 990 possible demographic combinations. In other words, there were 29 fields and 990 records associated with each of nearly 30,000 ZIP codes. Values at the county level could have been computed by aggregating several ZIP codes; however, county values would have been needed only if there were not enough individuals to accurately represent the ZIP codes. Table 1 shows the Woods and Poole file layout.

Field	Description	Abbreviation	Meaning
1	File Type Education Code)	CI	civilian noninstitutional population
		HE	enrolled in High School, years 1 to 3
		HS	enrolled in High School, seniors
		CE	enrolled in College
		HG	High School graduate only, no General Educational Development (GED), not enrolled
		GG	GED certificate only, not enrolled
		AA	Junior College degree only, not enrolled
		CG	College graduate, or more, not enrolled
		HD	not completed High School and not enrolled
2	State Abbreviation		
3	ZIP Code		
4	County Code		
5	Race	A	Asian, Pacific Islander (non-Hispanic)
		B	Black (non-Hispanic)
		H	Hispanic
		N	Native American, Other (non-Hispanic)
		W	White (non-Hispanic)
6	Sex	M	Male
		F	Female
7	Age	12-15	ages 12-15
		16	age 16
		17-19	ages 17-19
		20	age 20
		21	age 21
		22	age 22
		23-24	ages 23 and 24
		25-29	ages 25-29
8	Residence Status	D	Documented
		U	Undocumented
		T	Total (Documented + Undocumented)

Table 1. Woods and Poole Population Data

Figure 1 presents Woods and Poole actual population data from 2000-2005 and estimated population data from 2006-2020 (estimates based upon calculations using data from 1970 to the present). This shows relatively constant growth, with the exception of the region from 2009-2013.

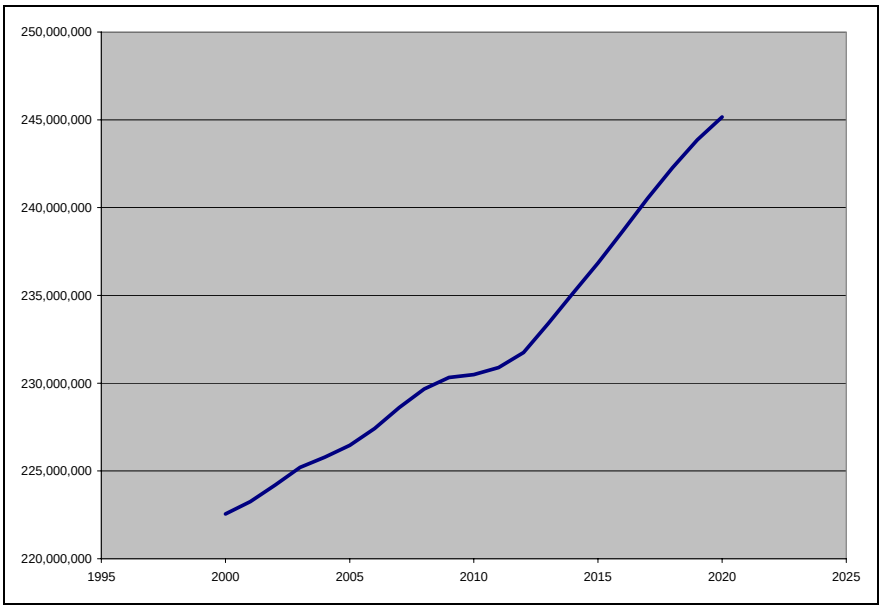

Figure 1. Total Population Ages 12-39 by Year

Figure 2 shows the binning of age data. As will be the standard method throughout this study, the data is broken out within each bin from 2000-2020 in order to provide a more precise display to show the relative size against other categories and how the data for each category changes over time. Again, note the behavior of the data at or near the year 2010 in each subcategory.

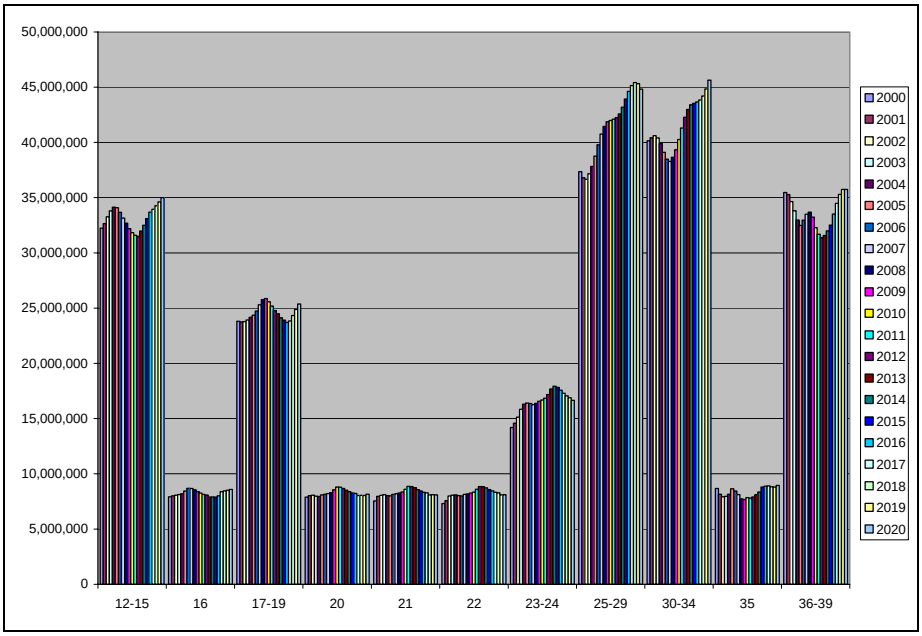

Figure 2. Population by Age Category (2000-2020)

Figure 3 displays population data broken down by education code. The education code of “CI” for civilian noninstitutionalized individuals makes up half of the population, but rarely are these individuals eligible for military service. This code was excluded from the figure simply to allow adequate detail to be viewed for comparison.

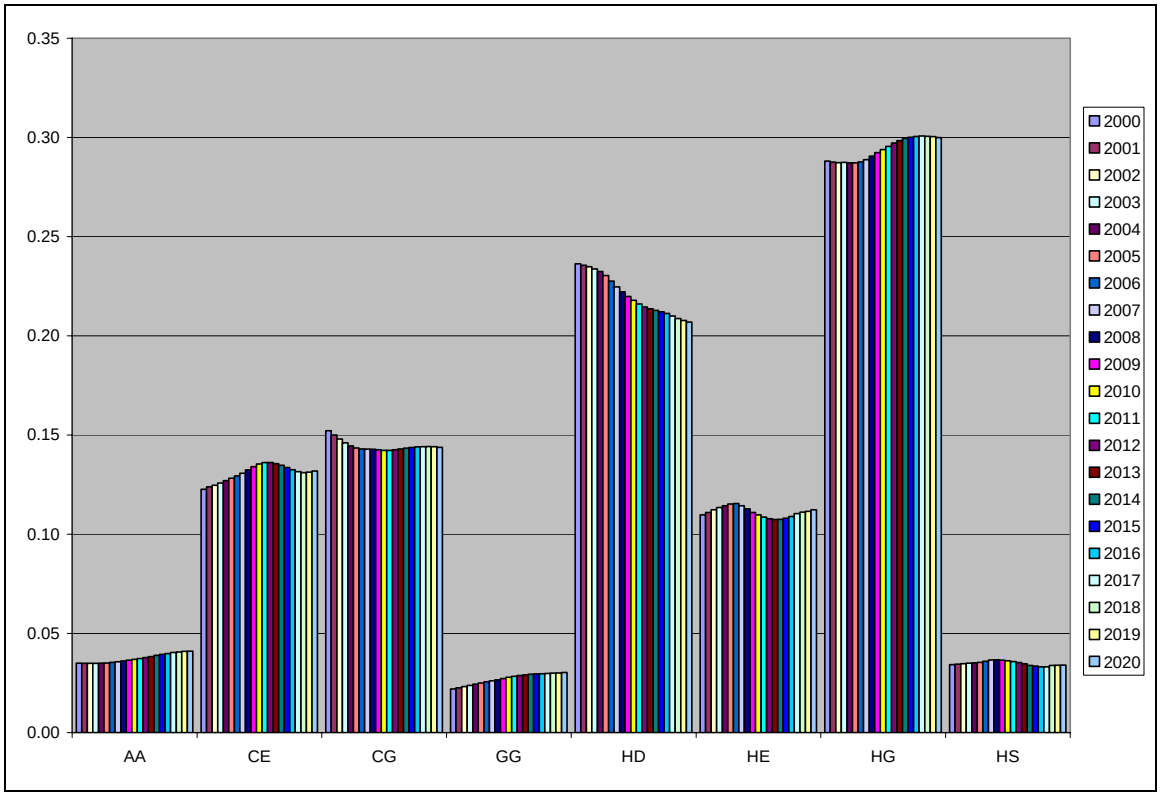

Figure 3. Population by Education Code Proportion (2000-2020)

Lastly, population data is broken down by race. Hispanic ethnicity is considered one of the five races used in this study. Figures 4 and 5 display the race factor by totals and proportions, respectively. While Figure 4 indicates relatively constant White population totals, Figure 5 shows a decreasing White proportion, meaning that the available military applicant pool will be more diverse in years to come.

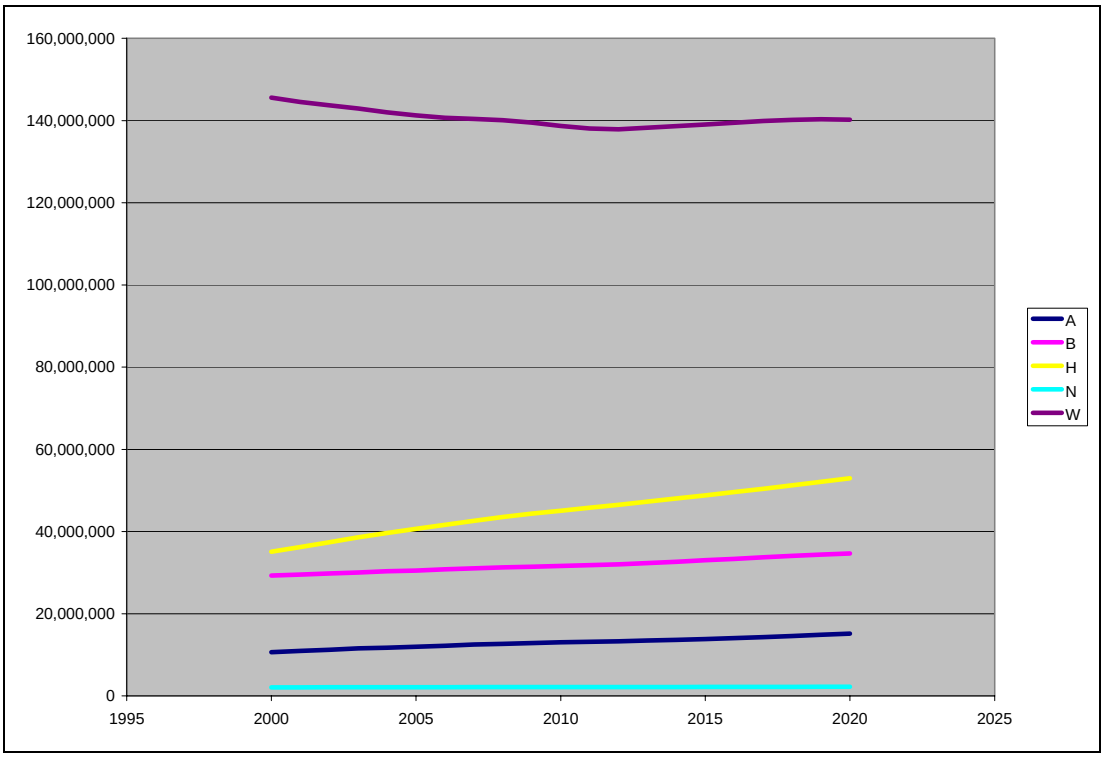

Figure 4. Population by Race (2000-2020)

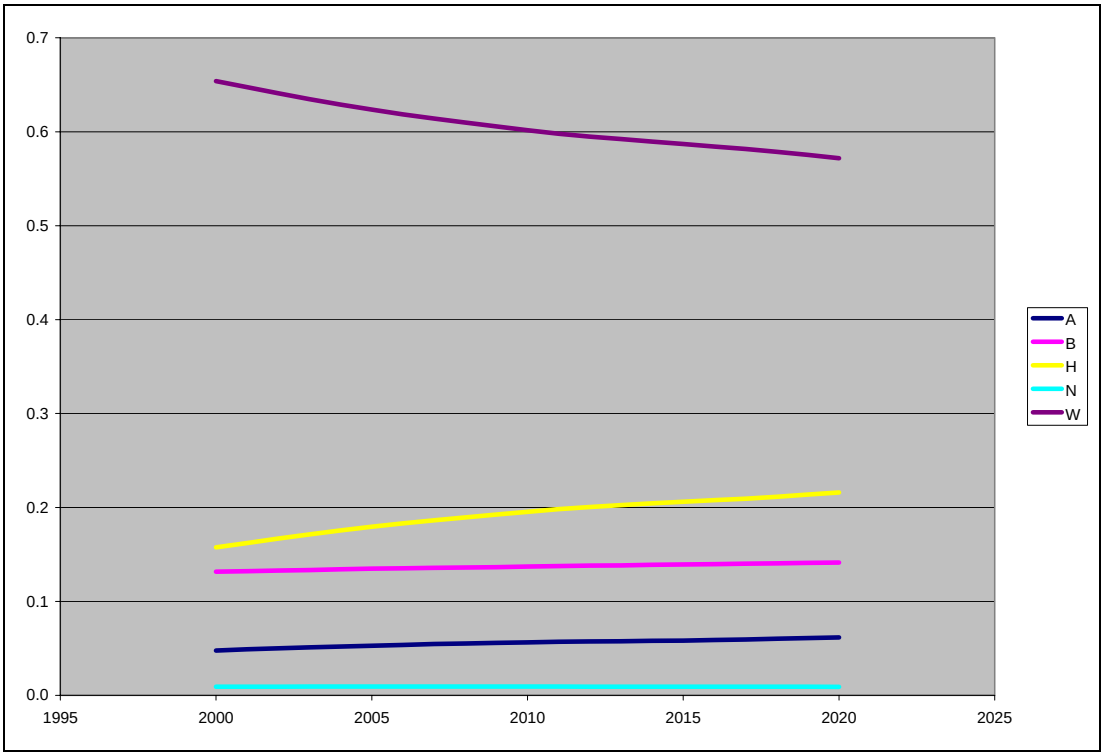

Figure 5. Population by Race Proportion (2000-2020)

B. DEFENSE MANPOWER DATA CENTER (DMDC)

DMDC provided a dataset that contained all applicants who applied for military service in FYs 1998-2006 (approximately 4.3 million records). Each record contained an applicant's desired service (active, reserve, or guard as applicable for Army, Navy, Coast Guard, Marines, or Air Force), Armed Forces Qualification Test (AFQT) score, education code, prior service flag, gender, race, home of record ZIP code, and age upon application and accession. The data provided an applicant's entry date into and discharge date from the Delayed Entry Program (DEP). Finally, the data also contained an applicant's accession service, as one could apply for one service, but actually end up joining another. The resulting dataset delivered by DMDC consisted of 18 fields and 4,296,409 records.

Modifications to the DMDC dataset were necessary in order to match the Woods and Poole dataset (see Table 2). Age was the simplest conversion, as the ages in the DMDC dataset were simply binned to match the Woods and Poole bins. The race and education category conversions were more involved, as the DMDC dataset contained more distinct codes in each case than Woods and Poole. For example, the DMDC race code "E" for White was converted to the Woods and Poole race code "W" for White. In the end, 7 race codes and 22 education codes for DMDC were converted to correspond to the 5 race codes and 9 education codes, respectively, provided by Woods and Poole.

DMDC Data		Education Key	
11	Less than high school diploma	11	HD
12	Currently in high school	12	HE
13	High school senior	13	HS
14	Credential near completion	14	HS
21	Test-based equivalency diploma	21	GG
22	Occupational program certificate	22	GG
23	Correspondence school diploma	23	GG
24	High school certificate of attendance	24	GG
25	Home study diploma	25	GG
26	Adult education diploma	26	GG
27	Army Guard Challenge Program GED	27	GG
31	High school diploma	31	HG
41	Completed one semester of college	41	CE
44	Associate degree	44	AA
45	Professional nursing diploma	45	AA
51	Baccalaureate degree	51	CG
61	Masters degree	61	CG
62	Post Masters degree	62	CG
63	First professional degree	63	CG
64	Doctorate degree	64	CG
65	Post doctorate degree	65	CG
99	Unknown	99	CI
		48	AA

Population Data	
CI	civilian non institutional population
HE	enrolled in High School, years 1-3
HS	enrolled in High School, seniors
CE	enrolled in College
HG	High School graduate only, no GED, not enrolled
GG	GED certificate only, not enrolled
AA	Junior College AA degree only, not enrolled
CG	College graduate, or more, not enrolled
HD	not completed High School and not enrolled

Table 2. DMDC to Woods and Poole Conversion

Figure 6 presents the distribution of AFQT scores provided by DMDC. The distribution is approximately normal for both applicants and accessions, except for accessions below 31. Due to the waiver requirements for those applicants scoring below 31, there are few accessions below this “cutoff.” The large number of zero scores was found to be in a large part (84 percent) due to

prior enlisted accessions (not required to retake the test). The small number of scores at 60 and 83 resulted from the impossibility of obtaining these scores using previous testing methods.

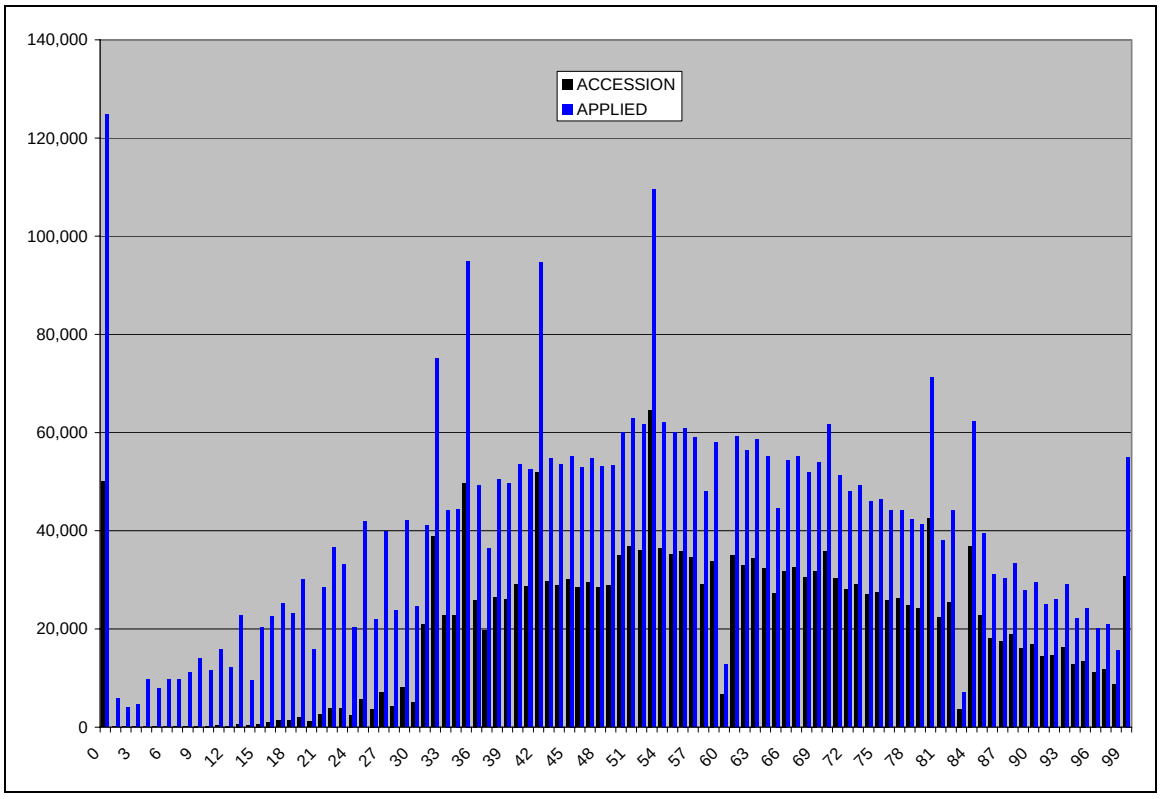

Figure 6. AFQT Applicants and Accessions

Figures 7-10 are provided for general comparison between total applicant population and service components. In short, the Marines accessed the youngest applicants on average, the Army accessed the most, and the Reserves were, on average, older. Most applicants were male high school graduates. See Table 3 for abbreviations used in this section.

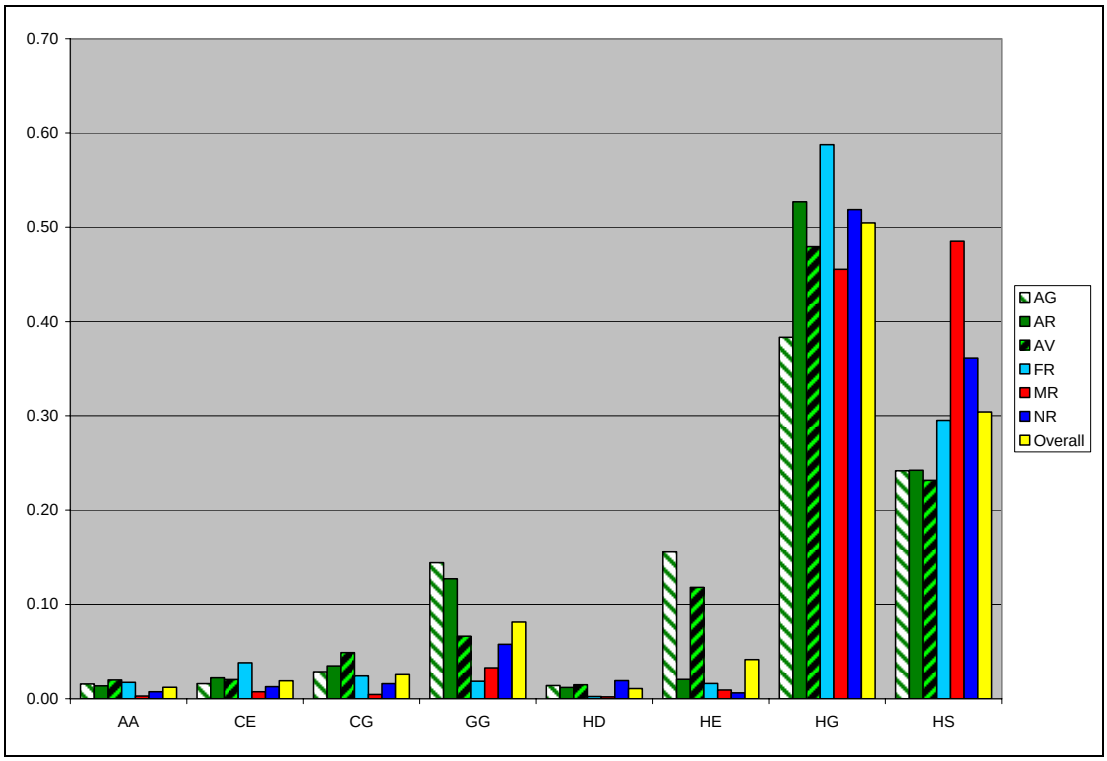

Figure 7. Accession Services by Education Code

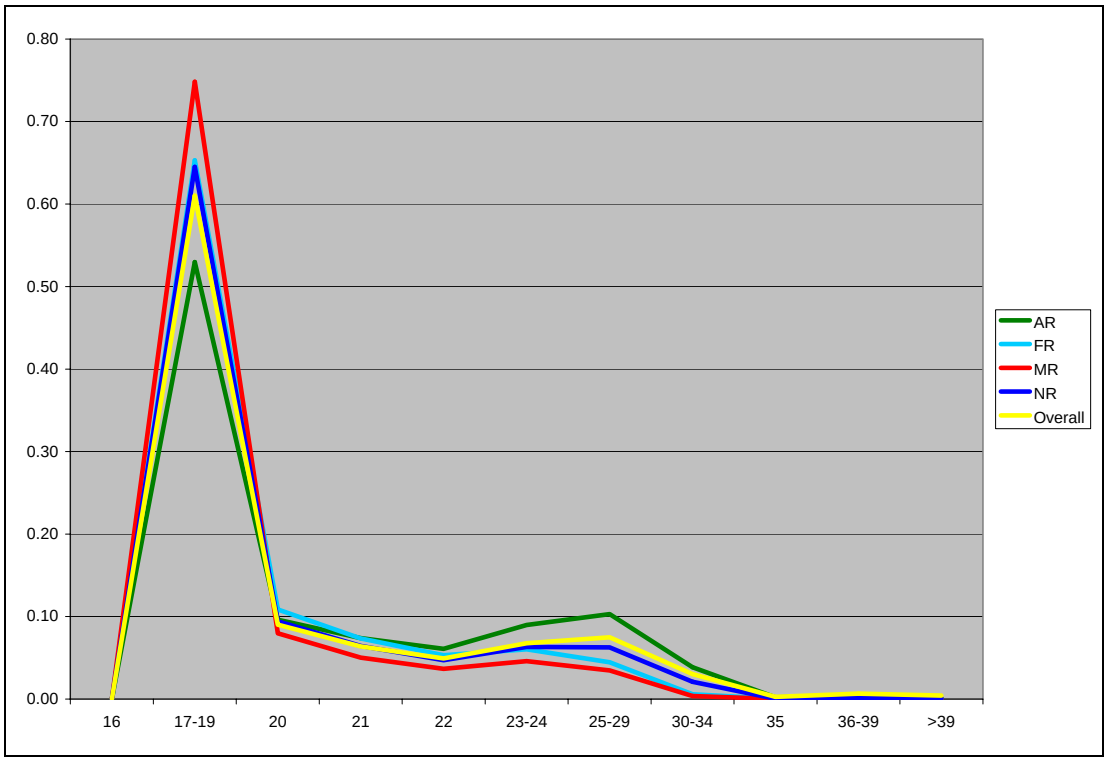

Figure 8. Accession Service by Age Category, Regular Components Only

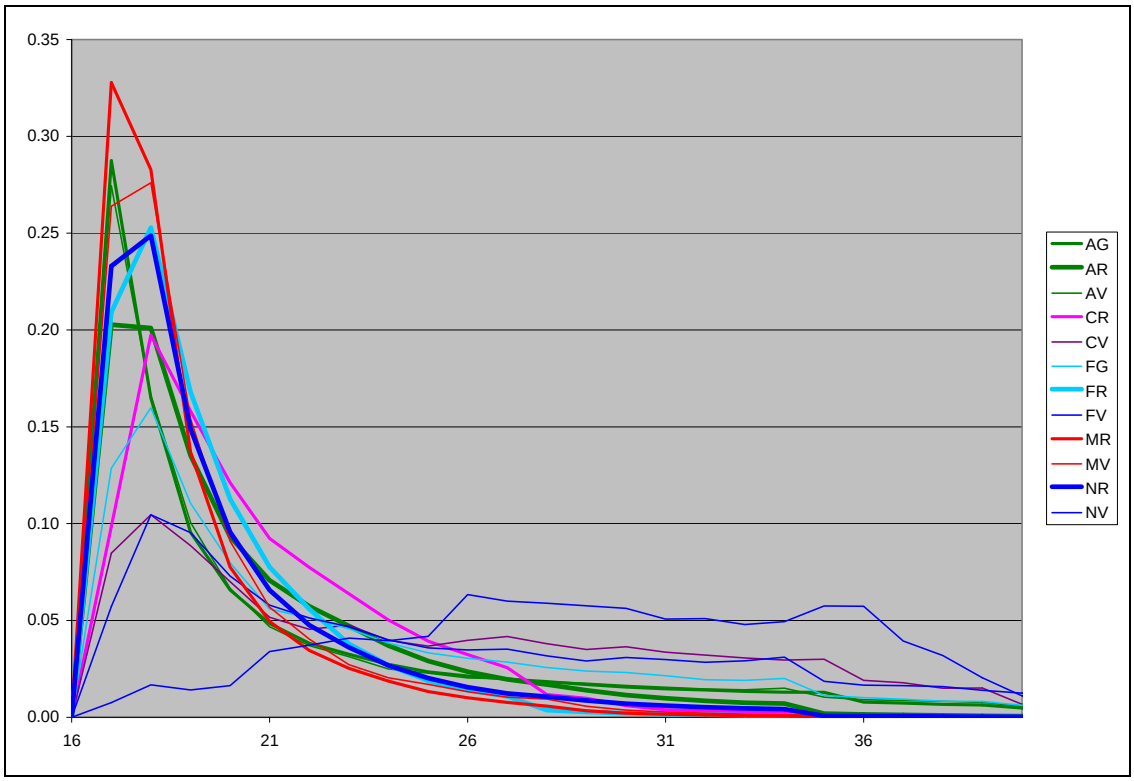

Figure 9. Applied Service by Age

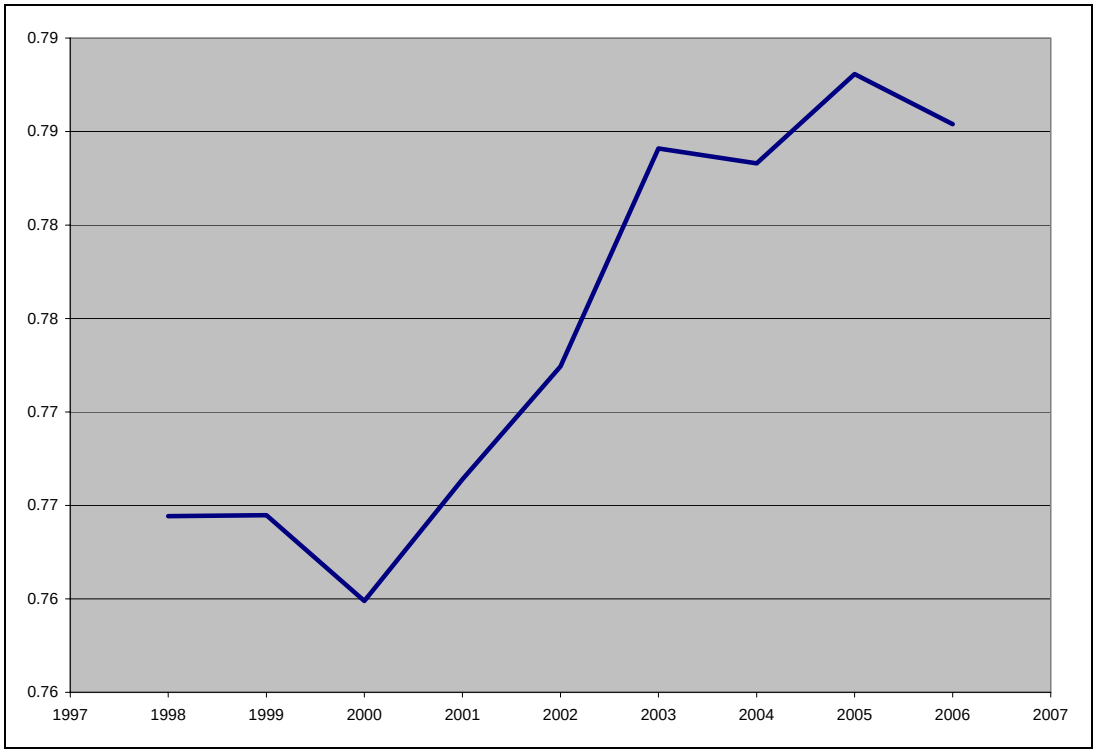

Figure 10. Proportion Male Applicant

C. NAVY RECRUITING COMMAND (CNRC)

In addition to Woods and Poole data, CNRC provided four types of files:

- ZIP code mapping to recruiting stations, zones, and districts;
- Latitude and longitude for the centroid of each ZIP code;
- Individual recruiter information including report date, transfer date, and assigned station; and
- Public high school information including ZIP code.

The recruiter information file contained more than 300,000 records on 12,500 recruiters from July 2001-June 2007. Unique identifiers were used to track individual recruiters and determine lengths of time in stations. Monthly data points allowed the computation of number of recruiters per station per month. Surprisingly, many of 1,800 recruiting stations were “part-time” (in some cases entirely unmanned).

ZIP codes (more than 41,000) served as the “keys” for organizing several billion pieces of data. To start, the station mapping file was merged with the recruiter information file by use of an inner join merge function, which took only records possessing identical keys (ZIP codes). Seven ZIP codes were unmatched between the files, and address verification helped to correct these probable typos. For example, 23542 was corrected to 23452 and 77000 was corrected to 77002.

The final CNRC dataset was merged with the DMDC and Woods and Poole datasets using an inner join merge function. More than 17,000 of the 56,105 DMDC ZIP codes (1.7 percent of the dataset) did not match the CNRC station mapping file (including ZIP code “0” from 5,670 individuals). The post-merge, final dataset used for this study contained 4,058,729 DMDC records

(nearly 95 percent of the original DMDC records), which included 28,719 ZIP codes corresponding to 96.1 percent of the Woods and Poole dataset, 1,044 stations, 209 zones, and 26 districts.

IV. DATA ANALYSIS

A. DEFENSE MANPOWER DATA CENTER (DMDC) DATA

Figure 11 shows total applicants and total accessions from 1998-2006. A steady increase is observed from 1998-2002, at which time there was a decline in applicants. Note that the ratio of applicants to actual accessions remained nearly constant throughout the entire period.

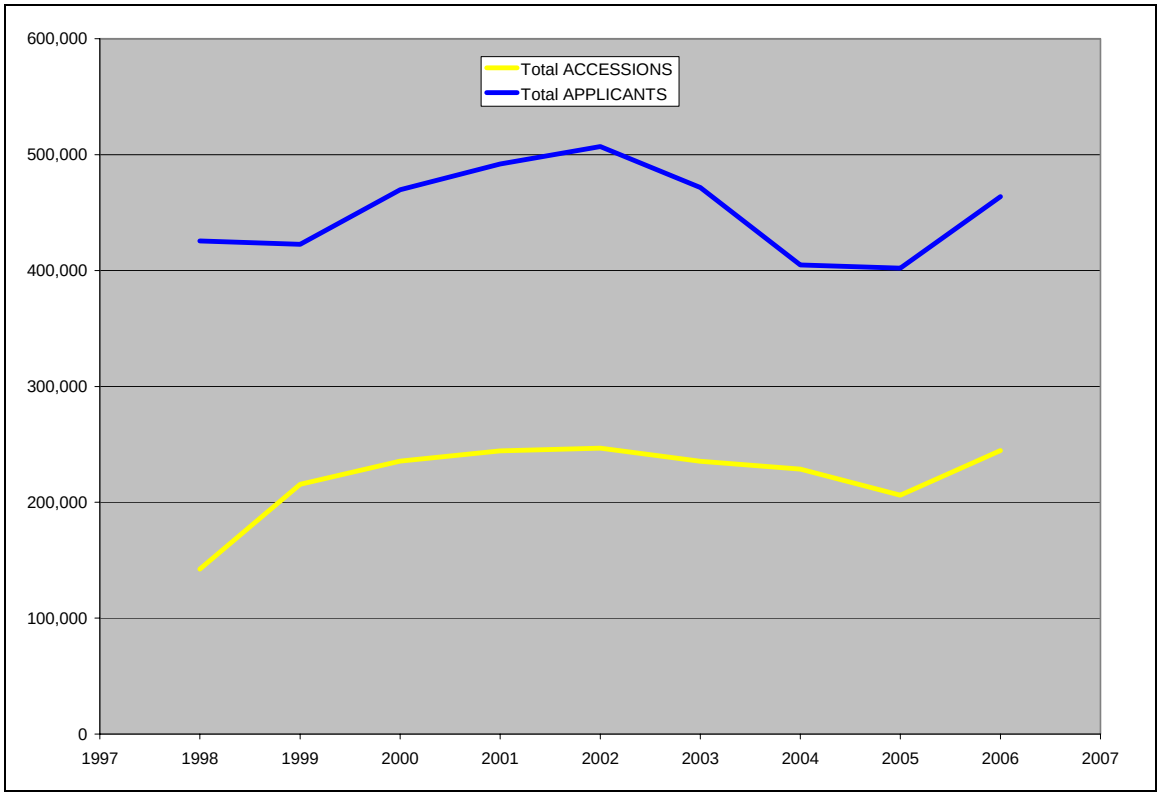

Figure 11. Total Applicants and Accessions (After[9])

Table 3 shows a breakdown of the service components reviewed in this study. Figure 12 clearly indicates that the Army recruited the most applicants.

[9] Department of Defense, "Population Representation in the Military Services – Fiscal Year 2004," Office of the Undersecretary of Defense, Personnel and Readiness, May 2006, retrieved on December 9, 2006 from http://www.dod.mil/prhome/poprep2004/, p. 2-9.

Component	Description
AR	Army Regular
AV	Army Reserve
AG	Army Guard
AZ	Army, component unknown
FR	Air Force Regular
FV	Air Force Reserve
FG	Air Guard
FZ	Air Force, component unknown
MR	Marine Corps Regular
MV	Marine Corps Reserve
MZ	Marine Corps, component unknown
NR	Navy Regular
NV	Navy Reserve
NZ	Navy, component unknown
CR	Coast Guard Regular
CV	Coast Guard Reserve
CZ	Coast Guard, component unknown
ZZ	Unknown service/component

Table 3. Component Description

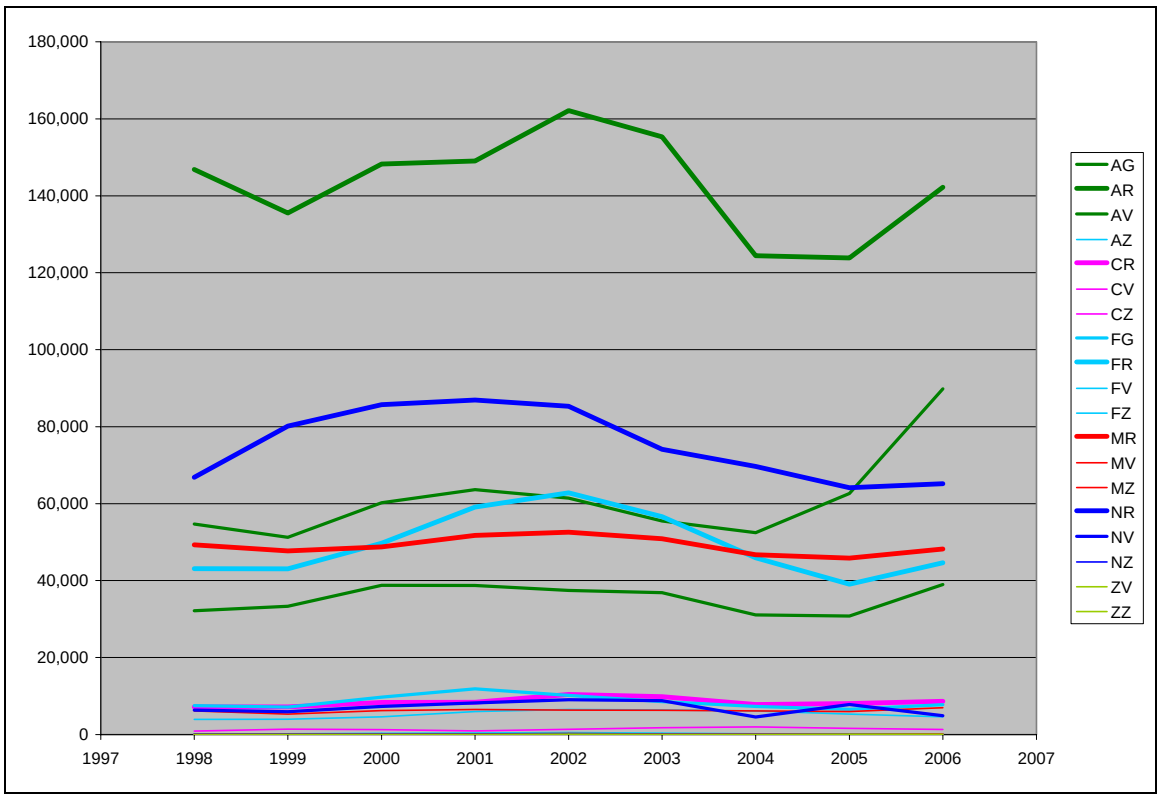

Figure 12. Applicants by Service

Figure 13 displays each service component's percentage of total applications across the nation. Note that the Regular Army component accounted for approximately one-third of all applications. Of particular interest is the Army National Guard, which experienced an increase of more than 50 percent from 2003-2006. Regular Navy peaked in 1999 and decreased by approximately 5 percent over the next seven years. After a noticeable rise in 2000-2002, Air Force levels returned to approximately 10 percent.

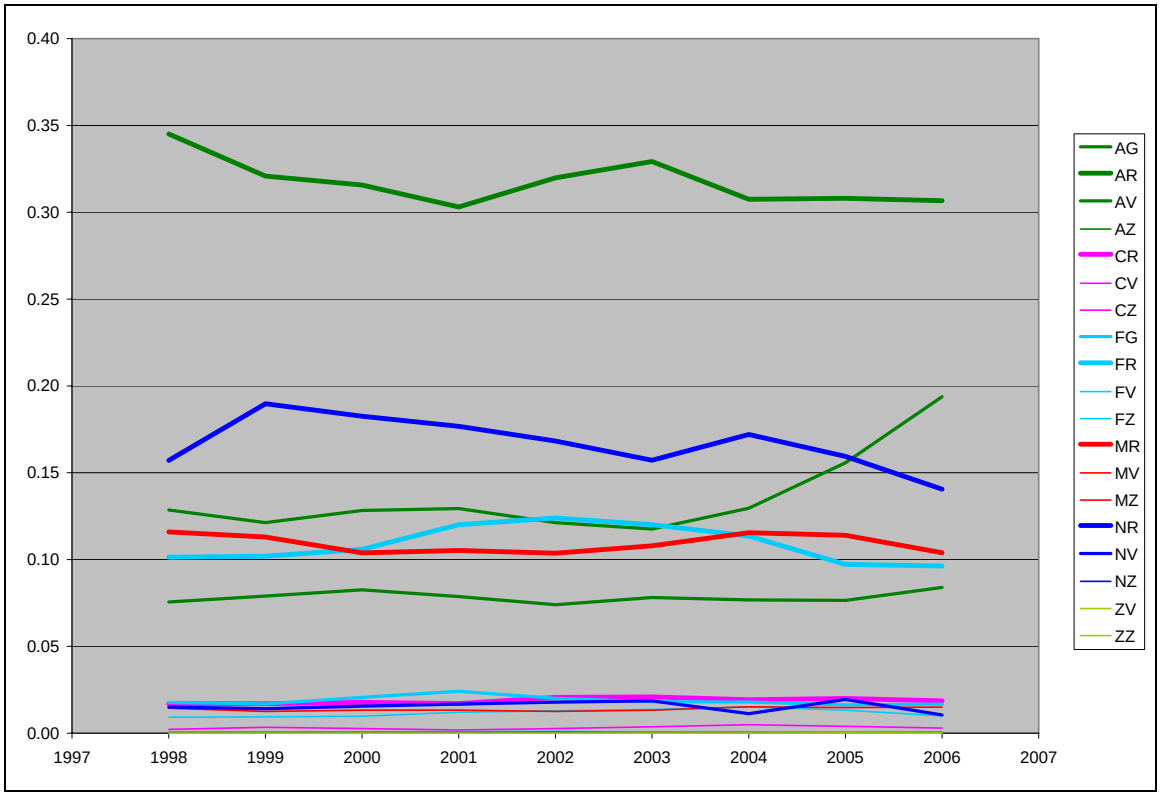

Figure 13. Applicants by Service Ratio

Figure 14 presents the number of accessions obtained by each service component. In general, most components experienced an increase in accessions from 1998-2006—the Regular Army nearly doubled during that period. The Regular Navy and Air Force, however, experienced decreases in accessions after initial boosts. Specifically, the Regular Navy observed a peak at nearly 50,000 accessions in 2001, and then experienced a steady decline over

the next five years to approximately 35,000 accessions in 2006. Air Force accessions dipped severely in 2005, due to end strength planning initiatives.[10]

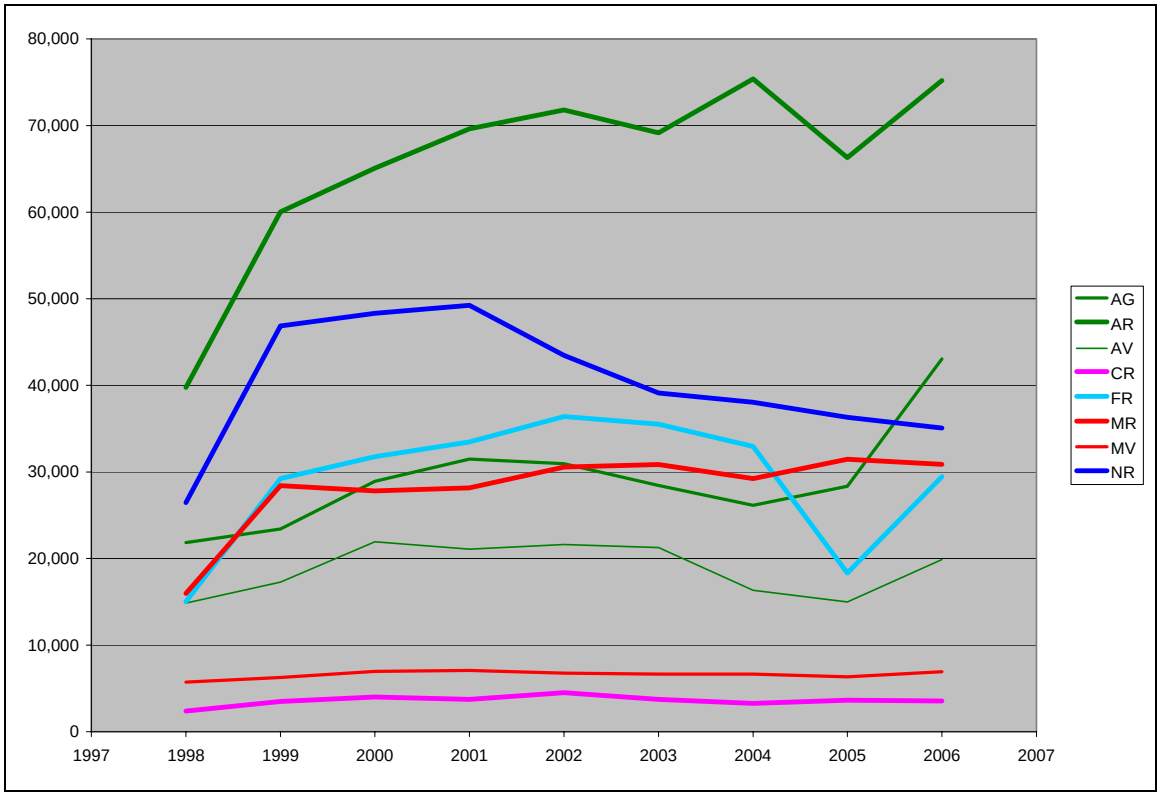

Figure 14. Accessions by Service

Figure 15 displays each service component's percentage of total accessions across the nation. As expected, the Regular Army accounted for the largest percentage of accessions. Approximately 56 percent of total DoD accessions in 2006 were attained by the three Army components (Regular, National Guard, and Reserves). Since 2001, in fact, the Army has accessed more recruits than all the other services combined. Note that the Army National Guard accessed more than the Regular Navy in 2006.

[10] Department of the Air Force, "Air Force Meets 2005 Enlisted, OTS Recruiting Goal," Air Education and Training Command, October 19, 2005, retrieved on September 19, 2007 from http://www.aetc.af.mil/news/story.asp?storyID=123026907.

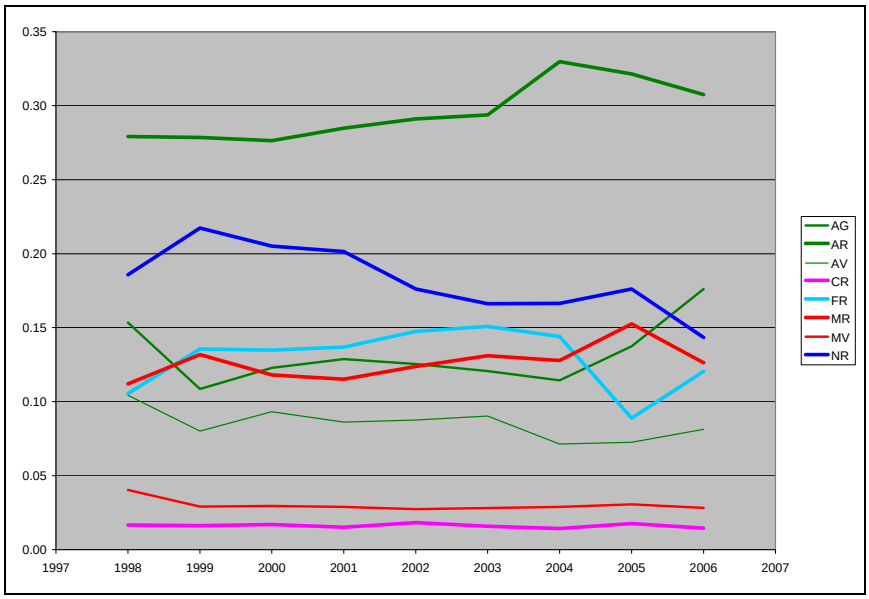

Figure 15. Accessions by Service Ratio

Figure 16 shows a trend breakdown of the dataset by race. Note that those whose applications reflected Hispanic ethnicity were included in the Hispanic race category ("H"). Other race categories are Asian Pacific Islander ("A"), Black ("B"), Native American/Other (non-Hispanic) ("N"), and White ("W"). It is important to note that after DoD race codes changed in 2003, previous race codes were modified, which may have introduced inherent bias in the "N" category due to its "catch-all" nature.

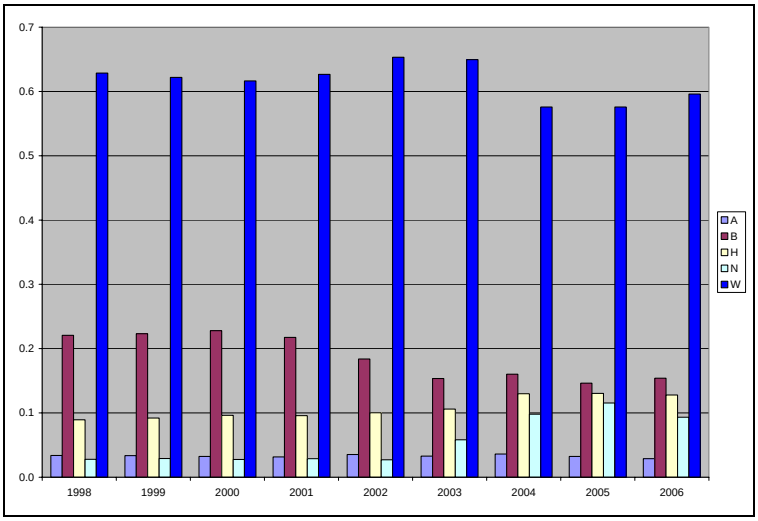

Figure 16. Proportion of Race by Year

Figure 17 shows total applicants broken down by age category, while Figure 18 displays the percentages within each age category. While Figure 17 indicates a sharp increase from 2005-2006 in 17-19 year-olds, Figure 18 shows a decreasing 17-19 year-old proportion.

Figure 17. Age Categories by Years

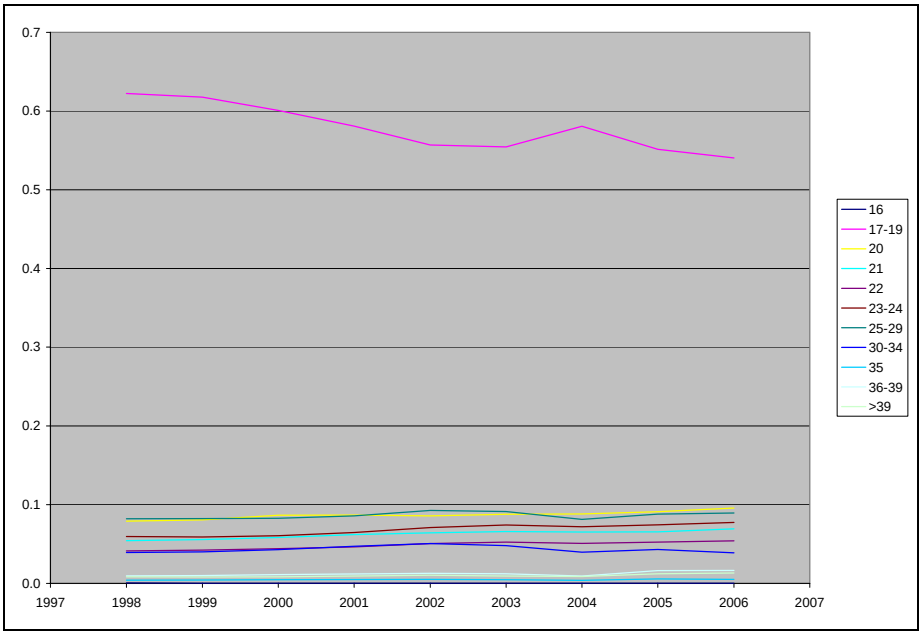

Figure 18. Age Categories by Years Ratio

Table 4 contains education codes. Figure 19 shows the relative proportions of applicants between all education categories, while Figure 20 shows the same information for accessions. Note that the high school graduate (HG) category accounts for half of the applicant pool. The high school senior (HS) category, the next largest group, has decreased significantly from 1998-2006 within the applicant (remained constant for accessions). Note that the GED (GG) category began a steady rise in 2004, and in 2006, accounted for more than 10 percent of applications and accessions. The high school drop-out (HD) category jumped sharply for both applicants and accessions in the last year due to demand for additional military enlistees. Compare this year to 1998, at which time the services could afford to be more selective with regard to education credentials.

Code	Description
CI	Civilian noninstitutional population
HE	Enrolled in High School, years 1-3
HS	Enrolled in High School, seniors
CE	Enrolled in College
HG	High School graduate only, no GED, not enrolled
GG	GED certificate only, not enrolled
AA	Junior College AA degree only, not enrolled
CG	College graduate, or more, not enrolled
HD	Not completed High School and not enrolled

Table 4. Education Codes

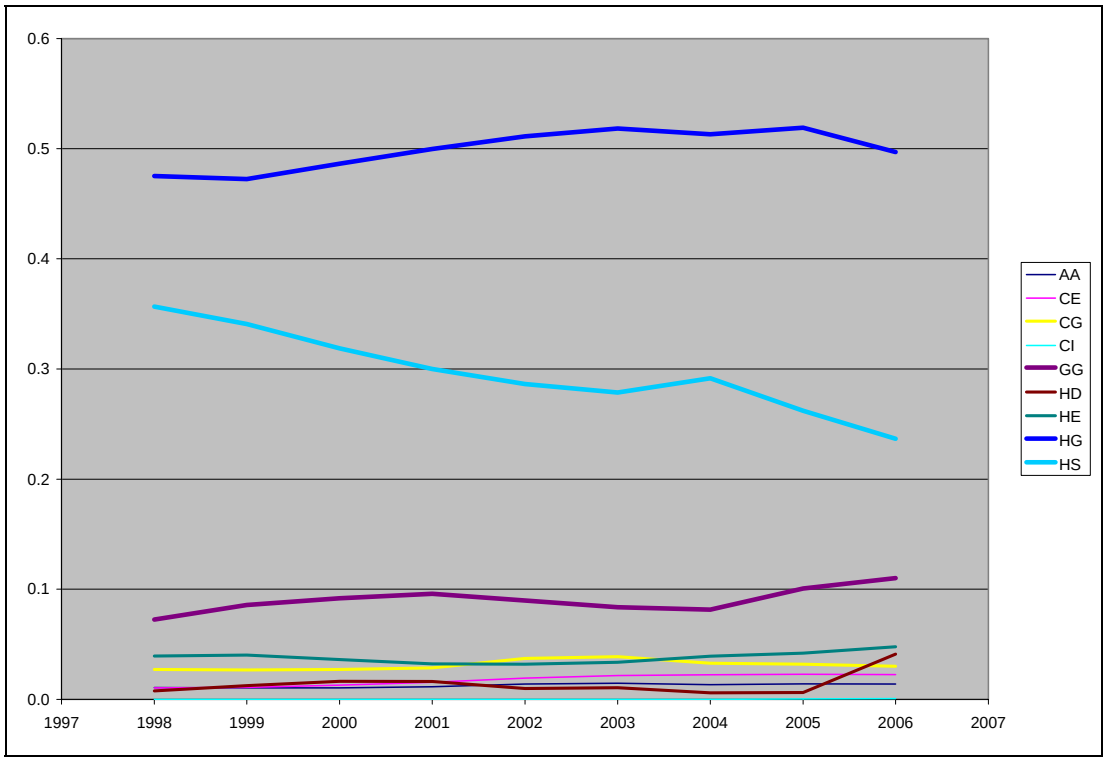

Figure 19. Proportion of Applicant Education Codes by Year

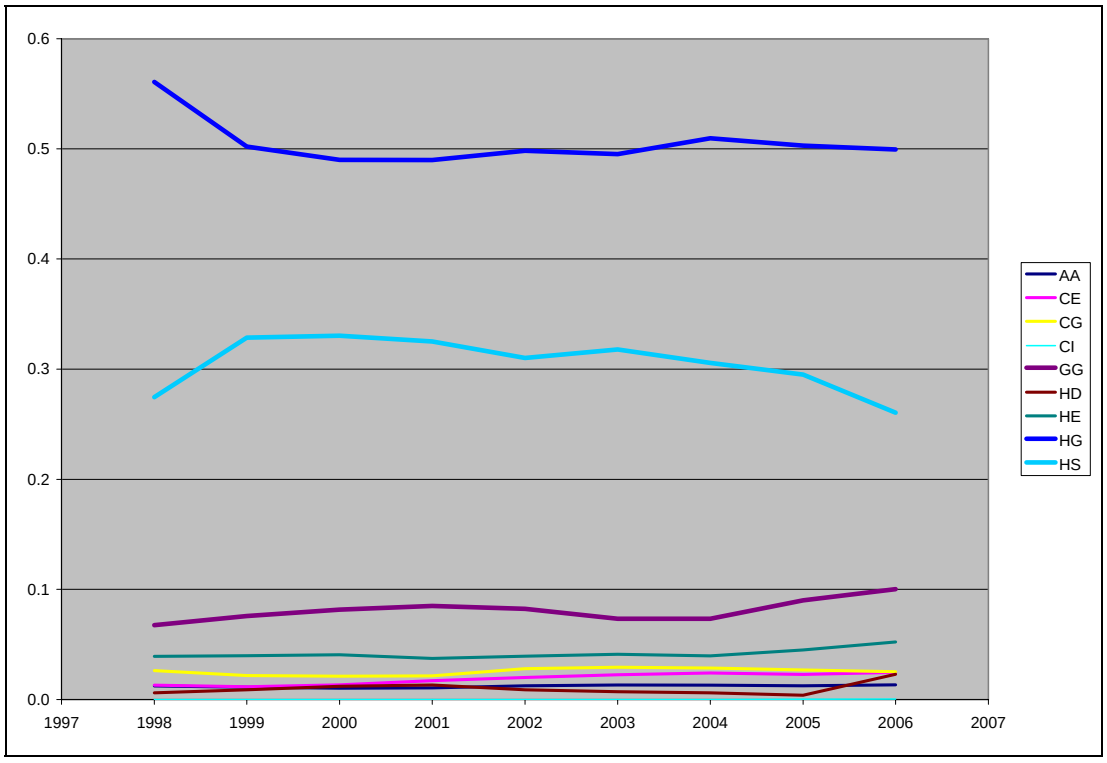

Figure 20. Proportion of Accession Education Codes by Year

Figure 21 presents average total recruiters, applicants per recruiter, and accessions per recruiter broken down by Navy Recruiting District (NRD). Note that these observations depend upon numerous factors such as geographic location and number of recruiters assigned within an area. One important similarity amongst the NRDs, regardless of location, is NRD Applicant-to-Accession ratio (not shown), which remains approximately constant throughout the country.

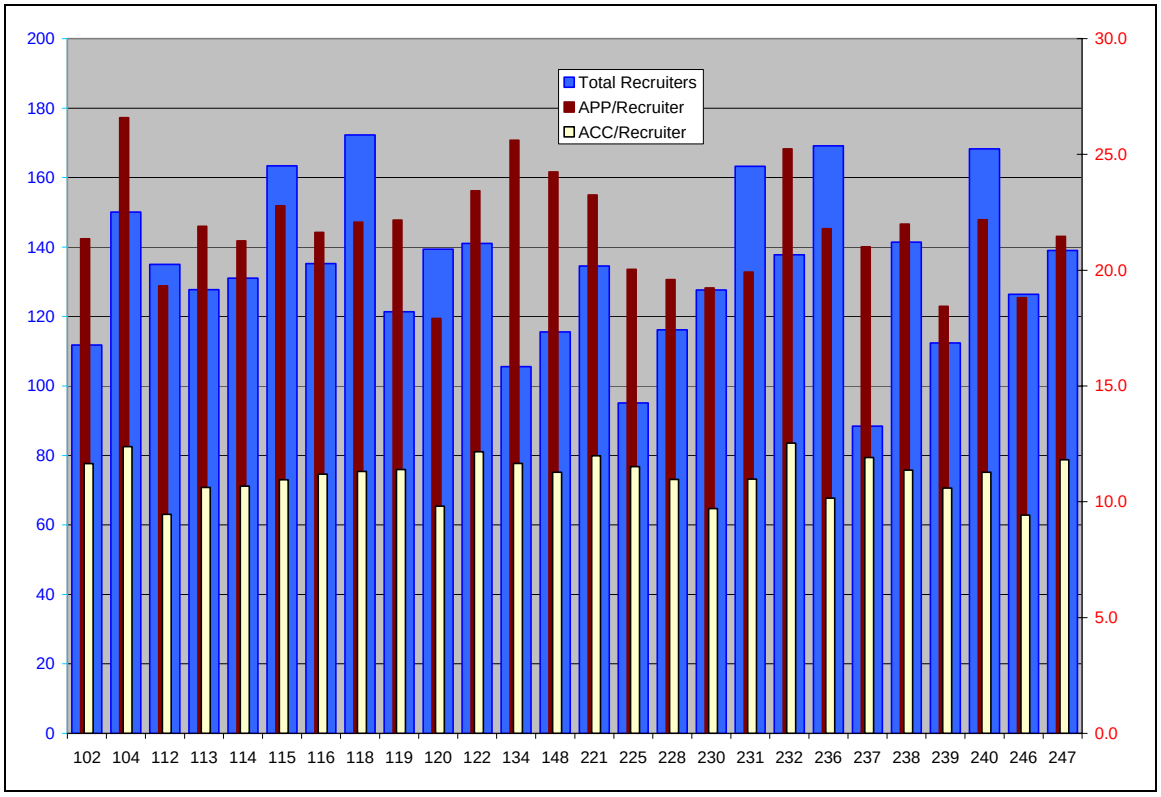

Figure 21. Recruiters, Applicants, and Accessions by NRD

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V. BUILDING THE MODEL

A. PROPENSENATOR CALCULATIONS

In order to provide Navy Recruiting Command (CNRC) an estimate of the correct number of recruiters, a prediction model was developed. The first step was to create usable datasets from the population data and Defense Manpower Data Center (DMDC). As shown in Table 5, the population data consisted of four categories (descriptions for race and education codes previously presented in Chapter III). Each of the 990 possible demographic combinations is referred to as a "demographic string." Of course, not every possibility was of interest due to unlikely combinations such as 17-19 year olds with college degrees who applied for enlistment.

Education	CI
	HE
	HS
	CE
	HG
	GG
	AA
	CG
	HD
Race	A
	B
	H
	N
	W

Sex	M
	F
Age	12-15
	16
	17-19
	20
	21
	22
	23-24
	25-29
	30-34
	35
	36-39

Table 5. Demographic Categories

The DMDC dataset was modified to derive the same subcategories found in the population dataset. For example, the DMDC education data was reduced from 22 to 9 subcategories. The age subcategory of 12-15 year olds was excluded (since those individuals are ineligible for enlistment). Although not

eligible for Navy enlistment, those over 39 years old (from DMDC) are included due to eligibility for other service components.

After the DMDC subcategories mirrored those in Woods and Poole, the 990 strings were sorted from highest number of applicants to lowest. This process allowed a rank to be placed on each demographic string. Interestingly, more than 95 percent of DMDC applicants could be captured with the top 161 demographic strings.

The total number of applicants in each demographic string was divided by nine to get an average number per year for FYs 1998-2006. The resulting values were divided by average populations (from 2000-2006) associated with the respective demographic strings in order to obtain a proportion ("demographic string ratio") of all applicants for each demographic string as compared to the general population. This process modified the DMDC dataset in an attempt to obtain the best possible representation of the population that applied for enlisted military service.

For example, the demographic string of HSWM17-19 (high school senior, White, male, aged 17-19) had 569,429 applicants apply for military service from FY1998-FY2006. These applicants made up more than 14 percent of all applicants during that time period. The average total number of all HSWM17-19 in the nation from 2000-2006 was 997,441. This resulted in a demographic string ratio of 0.0634, which meant that on average, approximately one-sixteenth of White, male, high school seniors aged 17-19 applied for enlisted military service per year.

The demographic string ratio was applied to each ZIP code for each year from 2000-2020 to produce "Propensenators." An estimate of Propensenators gives the number of individuals in a ZIP code who might be expected to apply to military service, based on the population characteristics of the ZIP code and the different propensities to enlist exhibited by different demographic groups. For example, since we expect about 6.3% of HSWM17-19 to apply each year, the

number of Propensenators in a ZIP code includes 6.3% of the HSWM17-19 residents. Since these Propensenators were derived for each ZIP code, it was possible to aggregate them at the recruiting station, zone, district, and national level. Figure 22 shows that until 2009, the number of Propensenators is predicted to rise. However, it is also predicted that beginning in 2010, there will be a steady decline in the number of Propensenators until 2016.

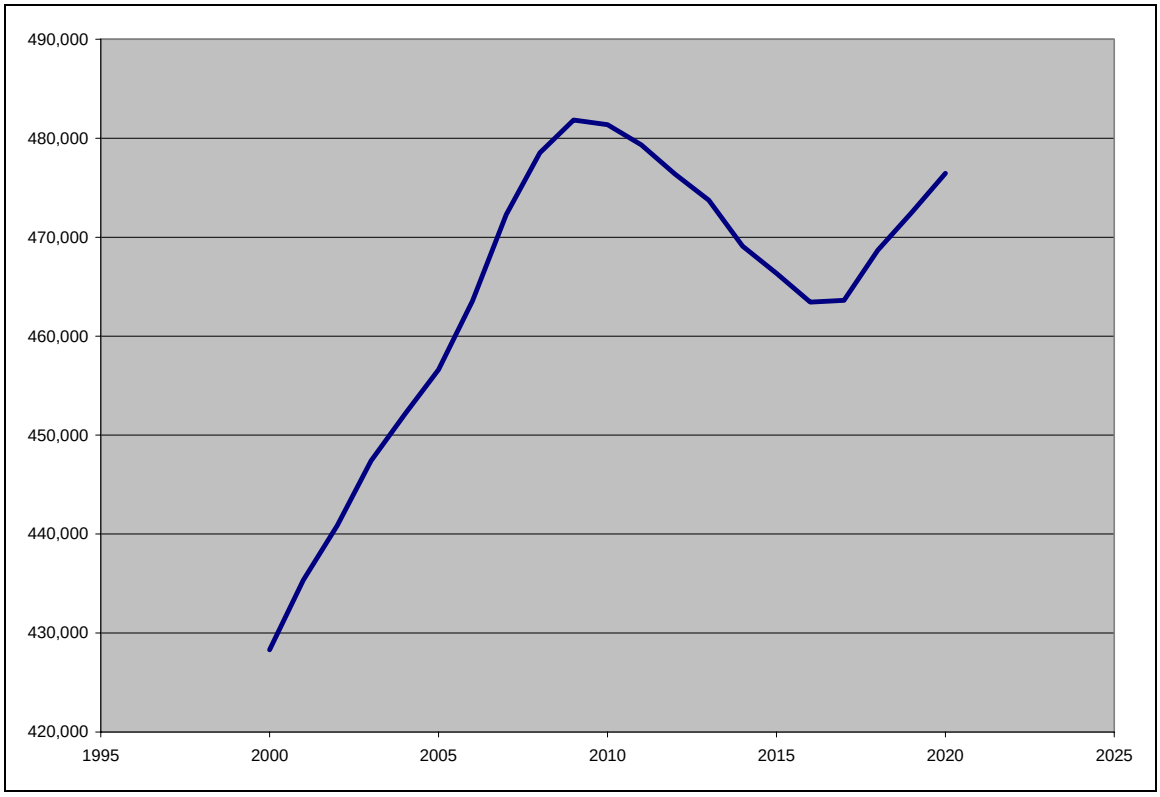

Figure 22. Propensenators by Year

Figures 23 and 24 show Propensenators for the East and West regions, respectively. The data is grouped by Navy Recruiting District (NRD) within each region (that is, values are plotted from 2000-2020 for each NRD). These displays allow individual districts to make comparisons as well as preview expected changes.

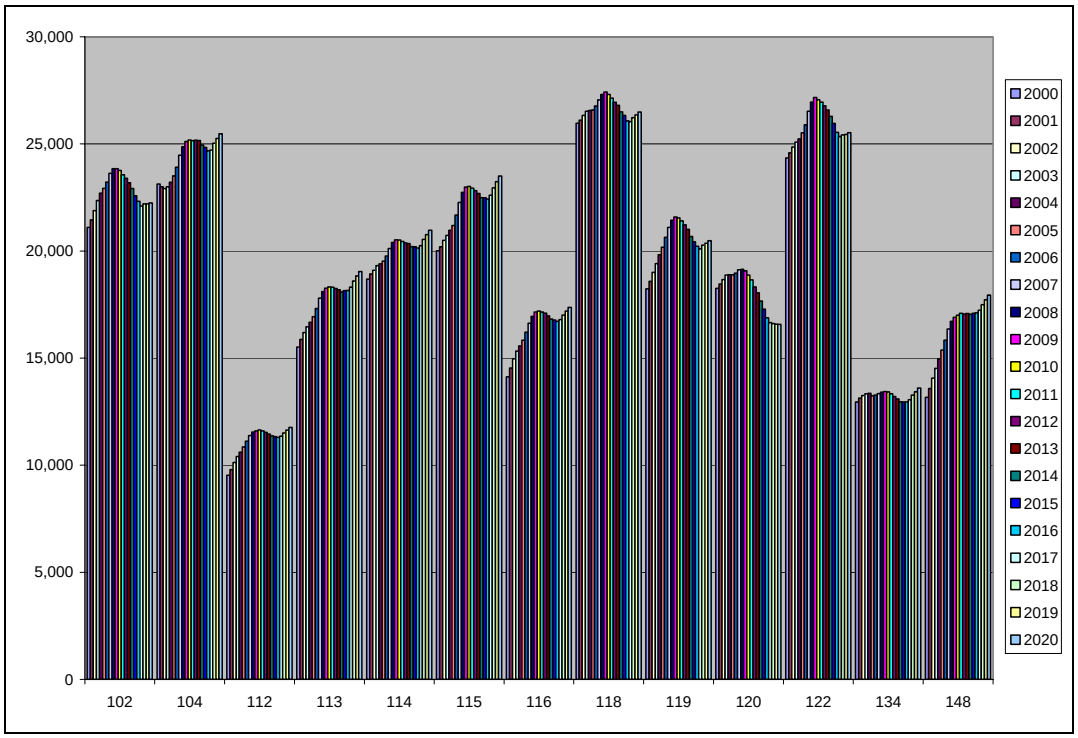

Figure 23. Region East Propensenators by NRD 2000-2020

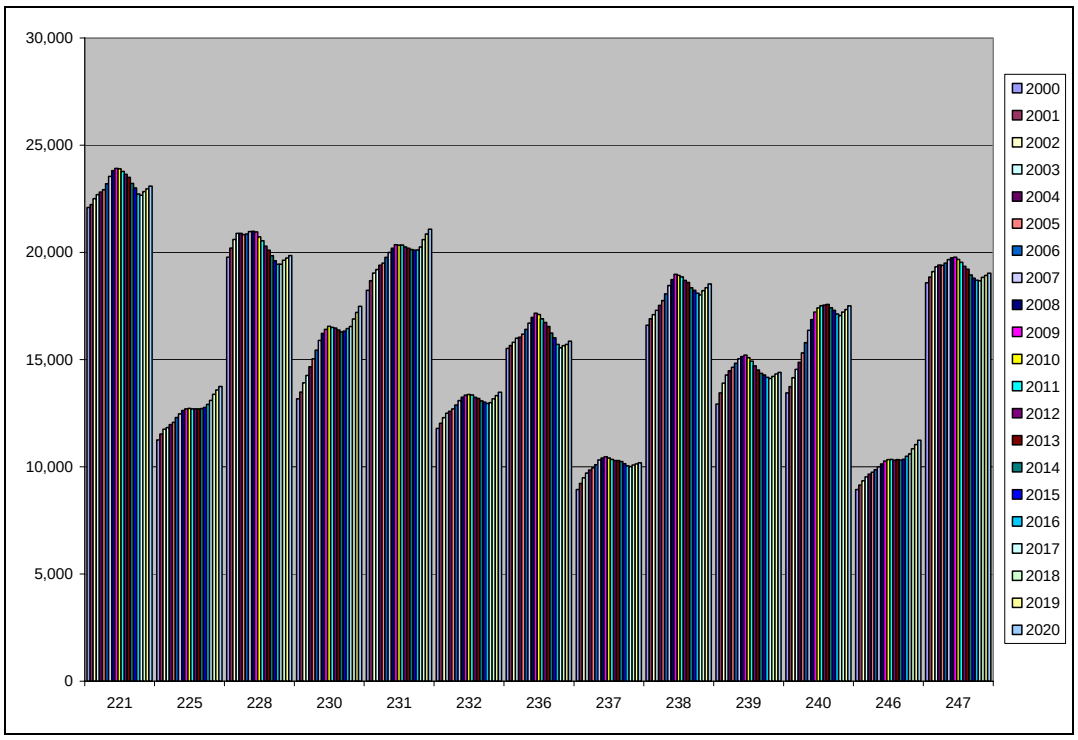

Figure 24. Region West Propensenators by NRD 2000-2020

Experience suggests that certain geographic areas have residents with different propensities to enlist, beyond demographic differences. In order to capture the geographic propensity to enlist from a single area, an average propensity ratio was produced by comparing the number of applicants per year to the total Propensenators for that same year. The number of applicants from each district, zone, and recruiting station was divided by the respective number of Propensenators, and then the overall average propensity ratio mentioned above was subtracted to normalize the data for each year and set the average value of the index to zero. Table 6 shows this index for all applicants, Regular Navy applicants, and Regular Army applicants from 2000-2006. To aid in the comparison of data over time, conditional formatting has been applied. If the value in a cell was greater than 0.05, then the cell has been shaded red; if the value in the cell was less than –0.05, then the cell has been shaded blue. Negative numbers correspond to areas with a ratio of applicants to Propensenators smaller than the national average. Similarly, positive numbers show areas with more applicants per Propensenator than the national average. It is important to note that neither the number of recruiters nor the ratio of recruiters to population were necessarily constant in any area. It is assumed that on average, recruiter characteristics between districts were essentially constant.

	ALL							NR							AR						
Ratio	1.102	1.135	1.150	1.054	0.895	0.881	1.000	0.201	0.201	0.193	0.166	0.154	0.140	0.141	0.348	0.344	0.368	0.347	0.275	0.271	0.307
NRD	2000	2001	2002	2003	2004	2005	2006	2000	2001	2002	2003	2004	2005	2006	2000	2001	2002	2003	2004	2005	2006
102	-0.09	-0.10	-0.07	-0.07	-0.04	-0.10	-0.13	-0.09	-0.08	-0.07	-0.06	-0.05	-0.05	-0.05	-0.08	-0.07	-0.06	-0.05	-0.02	-0.04	-0.07
104	-0.28	-0.28	-0.28	-0.27	-0.25	-0.32	-0.34	0.01	0.02	0.02	0.01	0.00	-0.02	-0.02	-0.07	-0.07	-0.09	-0.11	-0.09	-0.10	-0.12
112	0.43	0.41	0.39	0.30	0.24	0.27	0.31	0.08	0.09	0.11	0.09	0.09	0.12	0.11	0.24	0.23	0.18	0.15	0.12	0.10	0.15
113	0.03	0.02	-0.01	0.02	0.02	0.03	0.11	-0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.03	0.01	0.01	0.01	-0.02	-0.01	0.02
114	0.01	0.03	0.04	0.02	0.00	0.08	0.24	-0.04	-0.03	-0.03	-0.03	-0.03	-0.01	-0.01	-0.03	-0.02	-0.03	-0.02	-0.03	0.00	0.03
115	0.13	0.16	0.13	0.14	0.12	0.15	0.24	-0.01	0.00	0.00	0.02	0.03	0.03	0.03	0.07	0.07	0.05	0.05	0.05	0.04	0.08
116	0.25	0.21	0.18	0.18	0.15	0.09	0.08	0.02	0.02	0.02	0.03	0.04	0.04	0.02	0.10	0.08	0.06	0.08	0.05	0.01	0.03
118	-0.06	-0.02	-0.05	-0.06	-0.04	-0.04	-0.03	-0.03	-0.02	-0.03	-0.04	-0.03	-0.02	-0.02	-0.03	-0.01	0.00	-0.01	0.00	-0.01	-0.02
119	-0.08	-0.13	-0.20	-0.18	-0.16	-0.19	-0.20	-0.01	-0.02	-0.04	-0.03	-0.03	-0.03	-0.04	-0.04	-0.08	-0.09	-0.09	-0.07	-0.08	-0.09
120	0.04	-0.02	-0.03	-0.03	-0.01	-0.01	0.03	-0.06	-0.05	-0.04	-0.04	-0.04	-0.03	-0.01	0.02	-0.01	0.00	0.00	-0.01	0.00	0.00
122	-0.23	-0.20	-0.20	-0.18	-0.13	-0.07	-0.05	-0.04	-0.05	-0.05	-0.04	-0.04	-0.03	-0.03	-0.09	-0.06	-0.07	-0.06	-0.02	0.00	0.01
134	0.40	0.41	0.27	0.20	0.20	0.12	0.05	0.07	0.08	0.05	0.04	0.04	0.01	-0.02	0.08	0.06	0.03	0.02	0.01	-0.03	-0.05
148	0.08	0.08	0.14	0.05	-0.02	-0.02	-0.05	0.01	0.05	0.06	0.03	0.04	0.03	0.02	0.12	0.10	0.11	0.07	0.01	-0.01	0.04
221	-0.23	-0.18	-0.16	-0.17	-0.14	-0.13	-0.15	-0.03	-0.02	-0.04	-0.02	-0.03	-0.03	-0.02	-0.10	-0.08	-0.06	-0.06	-0.05	-0.03	-0.05
225	-0.11	-0.09	-0.01	0.06	0.06	0.10	0.01	0.01	-0.01	0.00	0.00	-0.02	-0.02	-0.02	-0.08	-0.07	-0.04	-0.02	0.00	0.04	0.00
228	-0.15	-0.17	-0.10	-0.09	-0.08	-0.06	-0.06	-0.06	-0.08	-0.07	-0.06	-0.06	-0.05	-0.05	-0.12	-0.11	-0.08	-0.08	-0.07	-0.06	-0.08
230	0.01	0.05	0.01	-0.01	-0.01	-0.03	-0.11	0.03	0.01	0.00	0.00	-0.02	0.00	-0.01	0.08	0.09	0.07	0.06	0.05	0.03	-0.01
231	-0.04	-0.06	-0.02	0.00	0.02	0.04	0.04	0.01	-0.01	-0.02	-0.01	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.02	0.02	0.05
232	0.10	0.12	0.16	0.14	0.17	0.15	0.16	0.11	0.12	0.13	0.13	0.12	0.10	0.09	0.08	0.07	0.08	0.06	0.07	0.07	0.15
236	0.09	0.03	0.04	0.06	0.02	-0.01	-0.12	0.08	0.06	0.08	0.06	0.04	0.03	0.04	0.01	-0.01	-0.03	0.01	0.00	0.01	-0.05
237	0.16	0.18	0.16	0.13	0.03	0.05	0.06	0.04	0.04	0.04	0.03	0.01	0.01	0.02	0.04	0.05	0.02	-0.01	-0.02	-0.01	0.00
238	-0.10	-0.11	-0.10	-0.04	-0.02	-0.07	-0.14	0.01	0.00	0.01	0.01	0.01	0.00	0.00	-0.01	-0.02	-0.01	0.03	0.04	0.02	-0.01
239	-0.06	-0.04	-0.06	-0.08	-0.11	-0.10	-0.16	0.00	-0.03	-0.04	-0.03	-0.03	-0.03	-0.02	-0.03	-0.02	-0.03	-0.04	-0.03	-0.04	-0.07
240	0.11	0.10	0.15	0.13	0.09	0.11	0.05	0.10	0.10	0.11	0.09	0.09	0.08	0.08	0.05	0.05	0.05	0.05	0.02	0.03	0.01
246	0.56	0.56	0.59	0.55	0.47	0.51	0.52	0.10	0.09	0.09	0.09	0.08	0.08	0.10	0.27	0.23	0.26	0.24	0.19	0.23	0.29
247	0.05	0.04	0.03	0.06	0.10	0.10	0.20	-0.01	-0.02	-0.02	-0.03	-0.02	-0.01	0.00	-0.02	-0.02	0.01	0.04	0.04	0.04	0.05

Table 6. Propensenator Ratio All/NR/AR

Note that NRD's 112 (Jacksonville), 232 (Houston) and 246 (San Antonio) have consistently produced more applicants per Propensenators than the national average for both the Army and Navy. Conversely, NRD 228 (Minneapolis) has consistently produced fewer.

VI. RESULTS AND CONCLUSIONS

The Propensenator was introduced in the last chapter as a reasonable way of modifying the Woods and Poole population dataset to determine a representative population of military applicants. The resulting propensity index matrix can be used to help explain the interactions between geographic regions, recruiters, and market share. Of course, there are other unseen factors such as unemployment rates, political environments, the number of recruiters, and of course, the recruiting goals that all contribute to these particular indices. This is reminiscent of Heisenberg's uncertainty principle in quantum mechanics, where he stated that "the more precisely the position is determined, the less precisely the momentum is known in this instant, and vice versa".[11]

Table 7 is provided to aid decision makers in (1) placing newly-reporting recruiters in stations or (2) moving existing recruiters between stations. First, the number of recruiters per Propensenator (that is, weighted population) is a qualitative representation of the available population market. Second, Applicants/Recruiter is a number representing the effectiveness of recruiters in particular geographic locations. In both panels, the ratios have been normalized as in Table 6, and similar conditional formatting applied.

[11] Heisenberg, uncertainty paper, 1927, retrieved on September 19, 2007 from http://www.aip.org/history/heisenberg/p08.htm·

		Recruiter/(Weighted Population)						(NR Applicants)/Recruiter					
NRD	NRD_name	2001	2002	2003	2004	2005	2006	2001	2002	2003	2004	2005	2006
102	NEW ENGLAND	-0.32	-0.35	-0.35	-0.30	-0.37	-0.39	-0.12	-0.02	-0.05	-0.03	0.03	0.07
104	NEW YORK	-0.22	-0.18	-0.09	-0.07	-0.09	-0.15	0.43	0.35	0.19	0.07	-0.06	0.04
112	JACKSONVILLE	0.72	0.78	0.67	0.68	0.67	0.60	-0.16	-0.13	-0.07	-0.06	0.11	0.10
113	ATLANTA	-0.06	0.04	0.00	-0.05	-0.03	-0.02	0.08	-0.02	0.06	0.11	0.00	0.03
114	NASHVILLE	-0.08	-0.08	-0.14	-0.16	-0.16	-0.05	-0.08	-0.07	-0.08	0.00	0.09	0.00
115	RALEIGH	0.00	0.06	0.05	0.04	0.00	0.01	0.02	-0.05	0.09	0.13	0.19	0.19
116	RICHMOND	0.20	0.23	0.22	0.14	0.09	0.05	-0.10	-0.12	-0.01	0.11	0.17	0.11
118	OHIO	-0.16	-0.14	-0.17	-0.18	-0.21	-0.16	0.05	-0.02	-0.07	0.02	0.06	0.01
119	PHILADELPHIA	-0.17	-0.21	-0.12	-0.13	-0.20	-0.23	0.09	-0.01	-0.10	-0.07	-0.06	-0.04
120	PITTSBURGH	0.06	0.03	-0.05	-0.09	-0.10	-0.03	-0.30	-0.24	-0.22	-0.18	-0.11	-0.06
122	MICHIGAN	-0.34	-0.38	-0.32	-0.28	-0.22	-0.25	0.16	0.23	0.14	0.03	0.00	0.03
134	NEW ORLEANS	-0.04	-0.01	0.03	0.03	0.07	0.04	0.43	0.27	0.20	0.20	-0.03	-0.20
148	MIAMI	0.06	0.04	0.01	0.01	0.04	-0.01	0.18	0.27	0.17	0.23	0.19	0.13
221	CHICAGO	-0.22	-0.22	-0.23	-0.25	-0.30	-0.23	0.14	0.04	0.11	0.05	0.09	0.08
225	DENVER	-0.03	-0.02	0.00	0.04	0.10	0.09	-0.04	0.01	-0.01	-0.14	-0.21	-0.20
228	MINNEAPOLIS	-0.27	-0.29	-0.33	-0.33	-0.27	-0.26	-0.19	-0.13	-0.05	-0.07	-0.12	-0.16
230	PHOENIX	0.29	0.17	0.15	0.12	0.16	0.03	-0.17	-0.12	-0.15	-0.20	-0.14	-0.08
231	DALLAS	0.14	0.07	0.03	0.06	0.08	0.05	-0.19	-0.14	-0.06	-0.03	-0.01	-0.06
232	HOUSTON	0.06	0.13	0.37	0.42	0.52	0.58	0.50	0.48	0.30	0.25	0.15	0.05
236	LOS ANGELES	0.35	0.45	0.43	0.47	0.41	0.26	-0.04	-0.03	-0.06	-0.14	-0.13	0.01
237	PORTLAND	0.19	0.19	0.15	0.16	0.19	0.23	0.00	0.02	0.01	-0.11	-0.10	-0.06
238	SAN FRANCISCO	0.01	-0.02	0.07	0.12	0.07	0.10	0.00	0.06	-0.02	-0.02	-0.04	-0.07
239	SEATTLE	0.10	0.08	0.04	-0.08	-0.04	0.04	-0.21	-0.24	-0.20	-0.13	-0.15	-0.19
240	SAN DIEGO	0.53	0.51	0.37	0.43	0.46	0.40	-0.01	0.03	0.11	0.10	0.07	0.10
246	SAN ANTONIO	0.75	0.76	0.85	0.70	0.73	0.65	-0.16	-0.16	-0.17	-0.12	-0.08	0.03
247	ST LOUIS	-0.07	-0.09	-0.13	-0.06	-0.09	0.03	-0.04	-0.02	-0.06	-0.07	-0.02	-0.06

Table 7. Recruiter per Weighted Population and Navy Applicants per Recruiter

Prior to recruiter placement, recruiting leaders should evaluate Tables 6 and 7 in three steps to determine likelihood of success and make the most educated, long-term decisions. First, one would view Table 7 to determine historical manning in a specific geographic location. Next, one would determine recruiter effectiveness by considering historical applicants per recruiter in that location. Finally, one would refer back to Table 6 to identify the propensity index (ratio of applicants to Propensenators) for Navy, Army, and nation (all Department of Defense). To further aid in understanding Tables 6 and 7, three general outcomes are described:

- **Recruiter to Propensenator below national average and Applicants per Recruiter low.** This combination implies that a geographic location has a low propensity to enlist, that is, recruiters in a particular area fail to process their “fair share” despite an

above-average number of eligible individuals in the population per recruiter. Note that an area could be erroneously classified for low propensity due only to the fact that no recruiters were assigned.

- **Recruiter to Propensenator above national average and Applicants per Recruiter high.** This combination implies that a geographic location has a high propensity to enlist.
- **Recruiter to Propensenator high and Applicant per Recruiter low or Recruiter to Propensenator low and Applicant per Recruiter high.** Indeterminate cases; unable to determine propensities to enlist. This is the most common instance, and the following story illustrates the uncertainties:

> Ten fishermen (with equal talent and equipment) are each assigned to one of two identical lakes. Initially, each lake has five fishermen, and all catch the same number of fish. If one lake becomes better stocked, then the fishermen on this lake will (1) catch more fish in the same amount of time or (2) catch the same number of fish in less time. Naturally, this success will lead some fisherman to switch to the better-stocked lake in hopes of doing better. If only one fisherman remained in the least-stocked lake, the lack of competition would lead to great success for him; however, the increased competition in the "best" lake (too many fishermen) would make it difficult for those fishermen to catch required quotas in the available time. The unbalanced markets would make the true propensity to catch fish unclear.[12]

To provide in-depth examples of the recommended evaluation process, four recruiting districts are discussed in detail. Note that the evaluation process can also be applied at zone and station levels, as the analysis in this study was based on aggregated ZIP codes.

NRD Atlanta (113). First, the Recruiter/Weighted Population (propensenator) portion of Table 7 indicates that this district was average. The Applicant/Recruiter section from Table 7 shows that NRD Atlanta was above

[12] David L. Schiffman, CDR, USN, personal conversation, April 12, 2007.

average when the number of recruiters dropped and average after the number of recruiters increased. Table 6 shows that except for the "All" category in 2006, the number of applicants in the Atlanta area was average for Navy, Army, and All (nation). To summarize, NRD Atlanta had average propensity to enlist and there was no advantage demonstrated by any one service (assuming a steady state number of recruiters for the other services). Recruiter effectiveness for the Navy was generally on par with the nation during the period of 2001-2006.

In order to investigate the "All" category for the Atlanta area in 2006, a special run of the data isolated NRD-113 and produced a matrix that aligned the services with applicants per year. Figures 25 and 26 show that the number of Navy applicants followed the national trend, while applicants for the Army National Guard rose dramatically in 2006. In fact, Army component applicants in 2005 and 2006 were 2,817-4,282 (AG), 4,411-5,638 (AR), and 1,236-1,866 (AV).

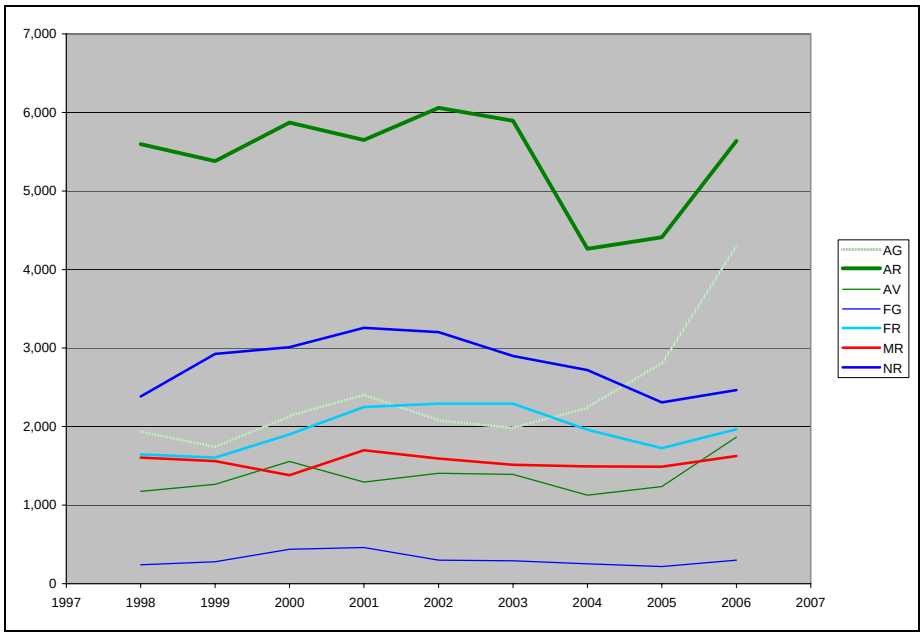

Figure 25. NRD-113 (Atlanta) Applicants per Year by Service

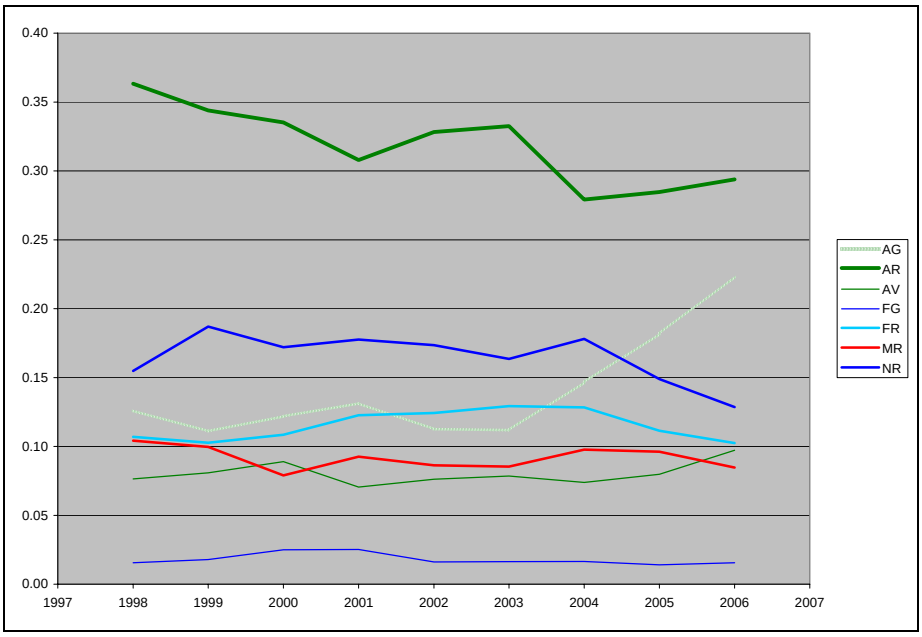

Figure 26. NRD-113 (Atlanta) Applicants per Year by Service Ratio

NRD Minneapolis (228). The Recruiter/Weighted Population (Propensenators) portion of Table 7 shows below average numbers when compared to the nation. The Applicants/Recruiter section of Table 7 also reveals a below average result. When the number of recruiters dropped, the number of applicants per recruiter increased. The number of applicants in the Minneapolis region has been below the average for "All," Navy, and Army. This region also has a below average propensity to enlist, with no evidence that any one service had an advantage. Recruiter effectiveness for the Navy in the Minneapolis area was sub-par during the period 2001-2006.

NRD San Diego (240). The Recruiter/Weighted Population (Propensenators) portion of Table 7 indicates that this district was well above average when compared to the nation. The Applicants/Recruiter portion of Table 7 also shows that NRD San Diego was above average. The number of applicants in the San Diego area was above the average for "All" and Navy, but Army was only considered average. This location of the country exhibited an

above average propensity to enlist, and the Navy showed that it had an advantage. Recruiter effectiveness for the Navy in NRD San Diego was above par during the period 2001-2006.

NRD Houston (232). This is an above average market for the Navy. The data show that a larger proportion of the total recruiting force was supplied to this area (as the Propensenator for this area steadily increased over time). Despite the success in the Houston area, care should be used prior to placing additional recruiters to avoid reducing applicants per recruiter to average levels, saturating the market, and thereby reducing recruiter effectiveness.

In the end, the “Propensenator” model allows recruiting leadership for the first time to tie together geographic propensities and recruiter allocations in order to analyze past allocation effectiveness and market penetration between services. Overall, it is clear that Navy Recruiting Command has been more efficient from 1998-2006 in recruiter allocation management when compared to the Army or the nation as a whole.

It is recommended that the model developed in this study be further refined by additional research and implemented as a permanent part of Navy Recruiting Command’s decision-making process. Further research could develop this model to manipulate desired characteristics, calculate goals, or to optimize the recruiting force based upon desired accessions or policy changes. Inefficient recruiter allocation can easily lead to mission failure at any level, so it is recommended that resource investments be made to support maintenance of the Propensenator model.

APPENDIX

This appendix provides a quick reference to a report entitled "Population Representation in the Military Services – Fiscal Year 2004."[13] Table 8 shows the breakdown of various services by race and gender for Fiscal Year (FY) 2004. Figure 27 shows how applicant and accessions have changed over time. Table 9 and Figure 28 give a representation of the education credentials of the various services. Figure 29 and Tables 10 and 11 show accession by geographic regions in the United States.

	Army	Navy	Marine Corps	Air Force	DoD
MALES					
White	65.2	60.6	79.5	74.4	68.1
Black	12.4	22.7	9.7	15.9	14.9
American Indian & Alaskan Native	1.0	5.5	1.3	0.9	2.1
Asian	2.1	5.2	2.1	3.3	3.0
Native Hawaiian & Pacific Islander	1.8	1.4	1.2	1.5	1.6
Two or more races	1.0	1.8	1.0	2.1	1.3
Unknown	16.4	2.8	5.3	2.0	9.0
Total	100.0	100.0	100.0	100.0	100.0
FEMALES					
White	54.6	52.2	71.3	65.9	57.6
Black	22.5	30.2	16.0	22.5	23.9
American Indian & Alaskan Native	1.6	5.8	2.2	1.2	2.6
Asian	2.5	4.9	2.4	3.4	3.2
Native Hawaiian & Pacific Islander	2.4	1.8	1.7	2.3	2.2
Two or more races	1.2	2.0	0.9	2.2	1.6
Unknown	15.3	3.1	5.5	2.6	8.8
Total	100.0	100.0	100.0	100.0	100.0
TOTAL					
Male	78.5	79.6	91.2	72.4	79.8
Female	21.6	20.4	8.8	27.6	20.2

Columns may not add to total due to rounding.
* Applicant data reported for FY 2004 are based on the DMDC edit version of the USMEPCOM file, which has been "cleaned" by the edit process. FY 2004 applicant data are consistent with Information Delivery System (IDS) data.
Also see Appendix Table A-3 (Race/Ethnicity by Service and Gender).

Table 8. Race and Gender of FY 2004 Active Component Non-Prior Service (NPS) Applicants,* by Service (Percent) (From[14])

[13] Department of Defense, "Population Representation in the Military Services – Fiscal Year 2004," Office of the Undersecretary of Defense, Personnel and Readiness, May 2006, retrieved on September 16, 2007 from http://www.dod.mil/prhome/poprep2004/, p. 1-5.

[14] Ibid., p. 2-7.

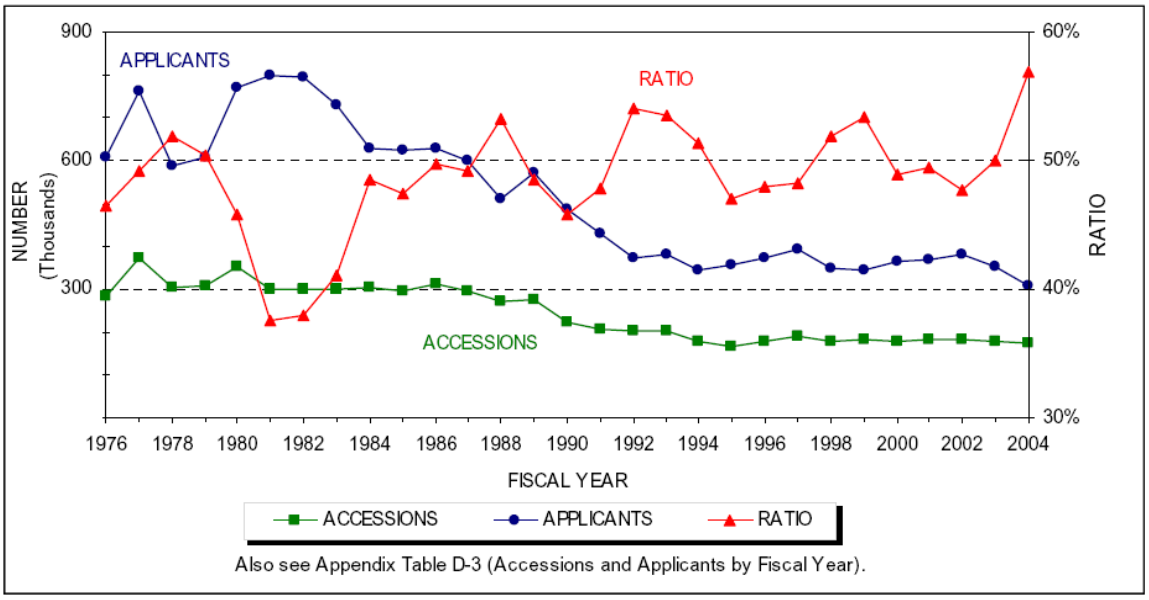

Figure 27. Number of Accessions and Applicants with Ratio of Accessions to Applicants, FYs 1976-2004 (From[15])

Education Level	Army	Navy	Marine Corps	Air Force	DoD	18- to 24-Year-Old Civilians*
Tier 1: Regular High School Graduate or Higher	85.9	93.9	96.6	99.0	92.0	79.7
Tier 2: GED, Alternative Credentials	13.1	4.7	3.3	0.8	7.2	
Tier 3: No Credentials	1.0	1.5	0.2	0.2	0.8	20.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
College Experience (Part of Tier 1)[1]	10.1	6.5	2.0	6.0	7.1	47.7

Columns may not add to total due to rounding.
* Civilian numbers and percentages combine Tiers 1 and 2 as civilian data include GED certificates with high school graduate rates.
[1] College experience data from the Services are defined as those individuals with the following credentials: associate degree, professional nursing diploma, baccalaureate, master's, post master's, doctorate, first-professional, or completed one semester of college.
Also see Appendix Tables B-6 (Education by Service and Gender) and B-7 (Education by Service and Race/Ethnicity).
Source: Civilian data are from Bureau of Labor Statistics Current Population Survey File, October 2003 – September 2004.

Table 9. Levels of Education of FY 2004 Active Component Non-Prior Service (NPS) Accessions, by Service, and Civilians 18-24 Years Old (Percent) (From[16])

[15] Department of Defense, "Population Representation in the Military Services – Fiscal Year 2004," Office of the Undersecretary of Defense, Personnel and Readiness, May 2006, retrieved on September 16, 2007 from http://www.dod.mil/prhome/poprep2004/, p. 2-9.

[16] Ibid., p. 2-17.

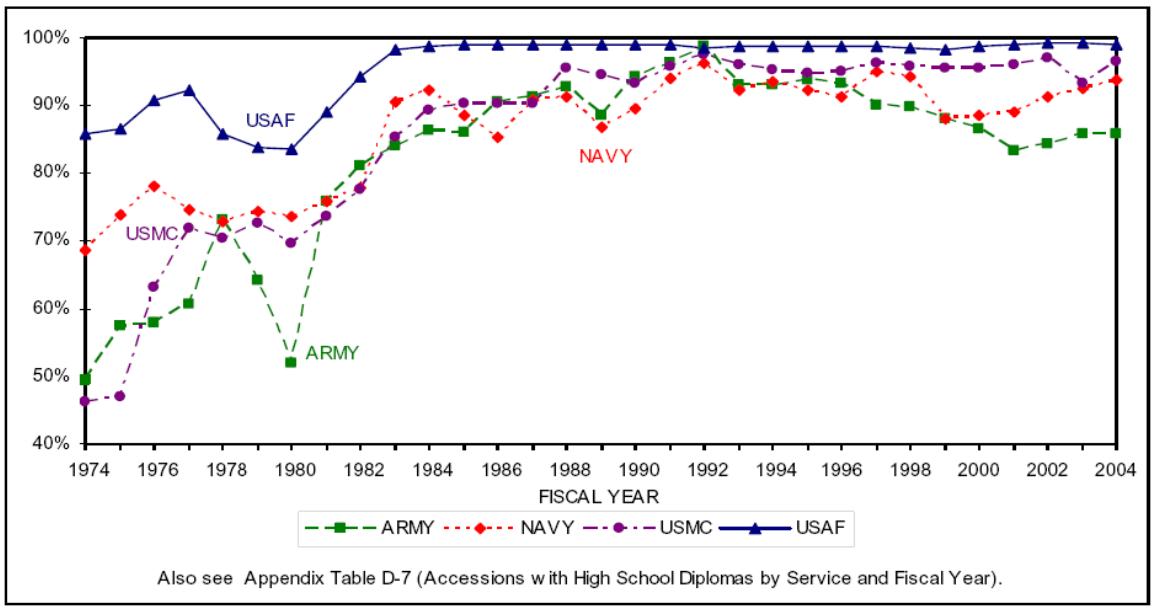

Figure 28. Active Component NPS Accessions with High School Diplomas, FYs 1974-2004 (From[17])

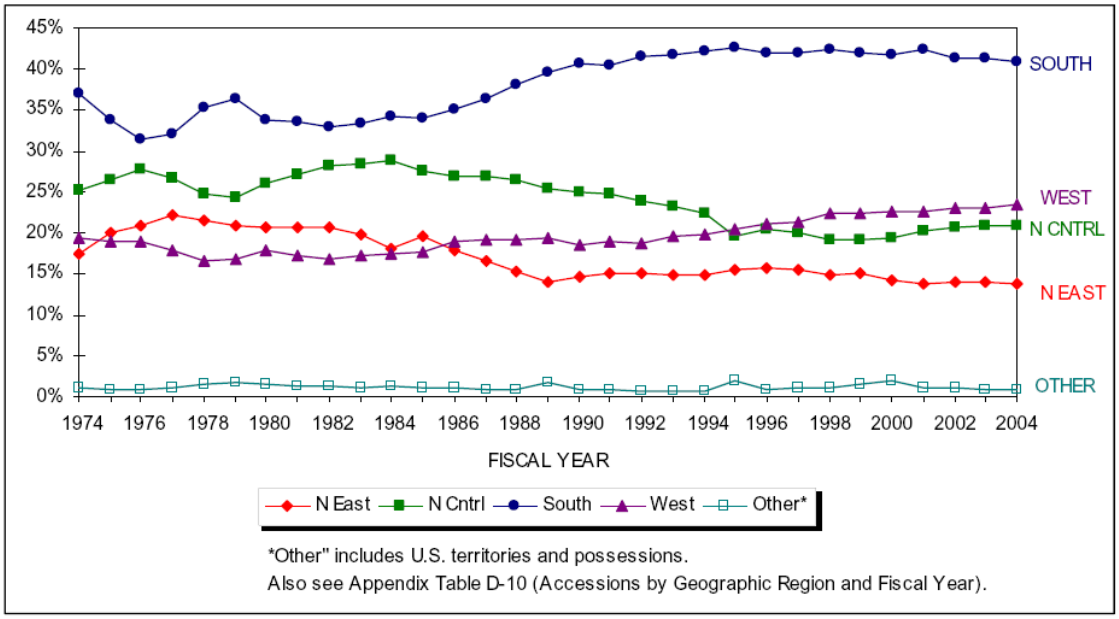

Figure 29. NPS Accessions by Geographic Region, FYs 1974-2004 (From[18])

[17] Department of Defense, "Population Representation in the Military Services – Fiscal Year 2004," Office of the Undersecretary of Defense, Personnel and Readiness, May 2006, retrieved on September 16, 2007 from http://www.dod.mil/prhome/poprep2004/, p. 2-17.

[18] Ibid., p. 2-24.

CENSUS REGION CENSUS DIVISION STATE	Area's Contribution of All NPS Accessions	Area's Percent of All NPS Accessions	Area's Percent of All 18- to 24-Year-Olds	Represen-tation Ratio	Percent of Accessions that are High-Quality*	Mean AFQT Percentile Score
NORTHEAST REGION	24,124	13.7	18.1	0.8	67.8	62.9
New England Division	*5,868*	*3.3*	*4.5*	*0.7*	*70.3*	*64.3*
Maine	920	0.5	0.4	1.3	70.4	65.1
New Hampshire	711	0.4	0.4	1.0	71.0	66.7
Vermont	280	0.2	0.2	0.7	75.0	63.9
Massachusetts	2,280	1.3	2.1	0.6	71.4	64.2
Rhode Island	368	0.2	0.4	0.6	64.7	63.0
Connecticut	1,309	0.7	1.1	0.7	68.4	63.2
Middle Atlantic Division	*18,256*	*10.4*	*13.5*	*0.8*	*67.0*	*62.4*
New York	8,762	5.0	6.7	0.8	65.3	62.0
New Jersey	3,300	1.9	2.8	0.7	66.2	61.0
Pennsylvania	6,194	3.5	4.1	0.9	69.8	63.8
NORTH CENTRAL REGION	36,874	21.0	22.5	0.9	71.1	64.0
East North Central Division	*25,346*	*14.4*	*15.4*	*0.9*	*70.7*	*63.9*
Ohio	6,816	3.9	3.8	1.0	72.1	64.0
Indiana	3,825	2.2	1.9	1.1	72.6	65.5
Illinois	6,718	3.8	4.5	0.9	67.7	62.5
Michigan	5,164	2.9	3.4	0.9	69.7	63.5
Wisconsin	2,823	1.6	1.9	0.9	73.9	65.7
West North Central Division	*11,528*	*6.6*	*7.1*	*0.9*	*71.9*	*64.3*
Minnesota	2,037	1.2	1.9	0.6	74.2	66.1
Iowa	1,656	0.9	1.1	0.9	74.9	65.3
Missouri	3,891	2.2	2.0	1.1	68.5	62.2
North Dakota	330	0.2	0.2	0.8	74.6	65.1
South Dakota	509	0.3	0.3	0.9	67.2	63.7
Nebraska	1,157	0.7	0.6	1.0	73.3	65.2
Kansas	1,948	1.1	0.9	1.2	74.0	65.1
SOUTH REGION	72,074	41.0	35.5	1.2	64.5	61.3
South Atlantic Division	*35,833*	*20.4*	*17.7*	*1.2*	*64.2*	*61.4*
Delaware	387	0.2	0.3	0.8	67.2	62.2
Maryland	3,200	1.8	1.6	1.1	65.8	62.7
District of Columbia	176	0.1	0.2	0.5	51.7	58.6
Virginia	5,276	3.0	2.4	1.3	65.5	62.7
West Virginia	1,129	0.6	0.6	1.1	64.3	60.6
North Carolina	5,462	3.1	2.9	1.1	64.6	61.1
South Carolina	3,208	1.8	1.6	1.2	62.0	60.1
Georgia	5,78	3.3	3.0	1.1	61.0	60.2
Florida	11, 208	6.4	5.2	1.2	65.4	61.5

Table 10. Selected Statistics for FY 2004 NPS Accessions by Region, Division, and State, and Civilians 18-24 Years Old (From[19])

[19] Department of Defense, "Population Representation in the Military Services – Fiscal Year 2004," Office of the Undersecretary of Defense, Personnel and Readiness, May 2006, retrieved on September 16, 2007 from http://www.dod.mil/prhome/poprep2004/, p. 2-25.

CENSUS REGION CENSUS DIVISION STATE	Area's Contribution of All NPS Accessions	Area's Percent of All NPS Accessions	Area's Percent of All 18- to 24-Year-Olds	Represen-tation Ratio	Percent of Accessions that are High-Quality*	Mean AFQT Percentile Score
SOUTH REGION (continued)						
East South Central Division	*10,507*	*6.0*	*5.9*	*1.0*	*62.1*	*60.6*
Kentucky	2,254	1.3	1.3	1.0	64.2	60.8
Tennessee	3,278	1.9	2.1	0.9	65.7	62.6
Alabama	3,297	1.9	1.6	1.2	61.4	60.1
Mississippi	1,678	1.0	0.9	1.0	53.5	57.3
West South Central Division	*25,734*	*14.6*	*11.9*	*1.2*	*65.8*	*61.6*
Arkansas	1,694	1.0	0.9	1.1	63.8	60.4
Louisiana	3,407	1.9	1.8	1.1	55.7	58.0
Oklahoma	2,725	1.5	1.4	1.1	63.3	61.1
Texas	17,908	10.2	7.8	1.3	68.2	62.4
WEST REGION	41,454	23.6	23.8	1.0	66.9	63.1
Mountain Division	*13,307*	*7.6*	*7.0*	*1.1*	*68.4*	*64.1*
Montana	925	0.5	0.3	1.8	71.1	65.3
Idaho	1,054	0.6	0.5	1.1	71.4	65.7
Wyoming	428	0.2	0.2	1.3	72.0	65.2
Colorado	2,950	1.7	1.6	1.0	71.7	65.7
New Mexico	1,272	0.7	0.7	1.1	61.2	59.8
Arizona	4,055	2.3	1.9	1.2	67.7	63.4
Utah	1,198	0.7	1.1	0.6	66.2	65.2
Nevada	1,425	0.8	0.7	1.1	66.2	62.8
Pacific Division	*28,147*	*16.0*	*16.8*	*1.0*	*66.2*	*62.7*
Washington	4,502	2.6	2.1	1.2	71.8	66.7
Oregon	2,523	1.4	1.1	1.3	72.1	66.3
California	19,738	11.2	13.0	0.9	64.3	61.4
Alaska	574	0.3	0.2	1.5	72.1	66.9
Hawaii	810	0.5	0.4	1.2	57.7	58.8
TOTAL (50 STATES + DC)	174,526	99.2	100.0	1.0	66.9	62.5
TERRITORIES OR POSSESSIONS	1,446	0.8			36.9	47.7
Puerto Rico	1,078	0.6			35.8	46.1
Virgin Islands	120	0.1			42.5	48.5
Other Territories or Possessions[1]	122	0.1			41.0	45.3
UNKNOWN	126	0.1			72.2	62.8
TOTAL	175,972	100.0			66.7	62.4

Columns may not add to total due to rounding.
* High-quality accessions are high school graduates who score at or above the 50th percentile on the AFQT. This column is the number of high-quality accessions in area divided by the total number of accessions in area.
[1] Other Territories or Possessions includes: American Samoa, Federated States of Micronesia, Guam, Marshall Islands, Northern Mariana Islands, Palau, and U.S. Minor Outlying Islands.
Source: Civilian data from Bureau of Labor Statistics Current Population Survey File, October 2003 – September 2004. The Civilian Population Survey does not collect data from residents of U.S. territories or possessions.

Table 11. Selected Statistics for FY 2004 NPS Accessions by Region, Division, and State, and Civilians 18-24 Years Old (Continued) (From[20])

[20] Department of Defense, "Population Representation in the Military Services – Fiscal Year 2004," Office of the Undersecretary of Defense, Personnel and Readiness, May 2006, retrieved on September 16, 2007 from http://www.dod.mil/prhome/poprep2004/, p. 2-26.

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